Better Homes and Gardens®

WOOD®

THE WORLD'S LEADING WOODWORKING MAGAZINE

AUGUST 1995 • ISSUE NO. 80
Please display until August 9

WORKBENCHES
WE TEST 14 MODELS

WALNUT COMPUTER DESK
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Visit our all-new WORKSHOP
See page 76

POOCH-PERFECT DOGHOUSE

MASTER THE BASICS OF PLASTIC LAMINATES
See page 56

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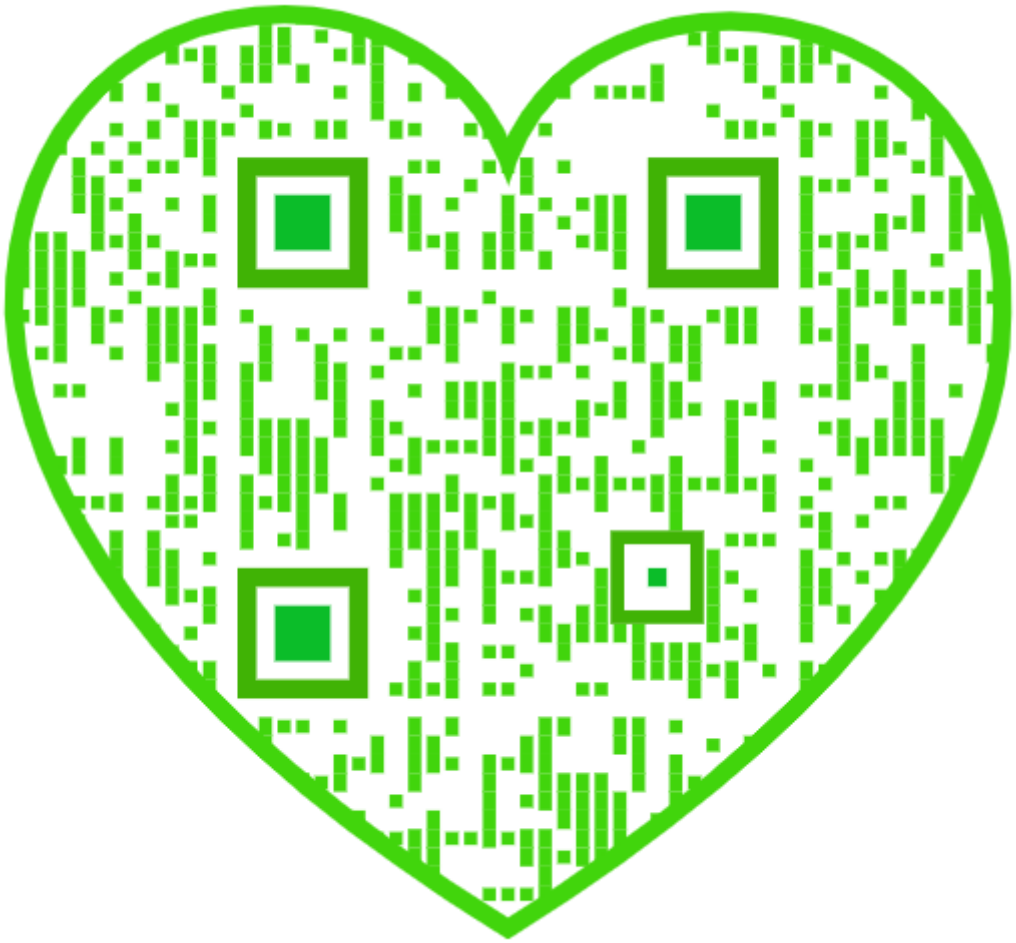

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THE EDITOR'S ANGLE

WOOD® MAGAZINE'S ON-SITE WORKSHOP GETS A FACELIFT

To see and find out more about the newly remodeled WOOD magazine workshop, please turn to *page 76*. I think you'll be impressed.

Over the past decade, literally thousands of you, our valued readers, have visited us here at our offices in Des Moines, Iowa. And believe me, we have loved every minute of the time we've spent with you. After all, it's not often that a magazine staff has the opportunity to meet with the people they work so hard to please.

But in the past, every time we opened the doors to our on-site shop and walked in to give a tour, we knew full well that its condition didn't represent us as well as we would like it to. Like many woodworking shops, it wasn't overly well organized. And as a result, we weren't using our space efficiently.

But now, after several months of intensive work, I think we've finally got our act together. As you can see in the photo above, the shop is now ship-shape and ready for your inspection.

Take a look at Pete Stephano's article starting on *page 76* if you want to get a better look at our pride and joy. And if you happen to be in our neck of the woods sometime in the future, we'll show it to you in person, OK? We're here weekdays from 8 to 5.

Larry Clayton

WE HAVE WINNERS—

THE GREAT SCROLLSAW PROJECT-DESIGN CONTEST

As is always the case when we have a contest, you readers certainly showed your creative talent in our latest venture. And now that we have chosen the winning designs, it's time for us to show them off.

The leaf-shaped design on a stand (shown *at left*) created by Kurt Lundberg of Anaheim, California, is but one example of the fine projects chosen. To see the others, please turn to *page 6*.

This project took First Place in the Put-Together Projects category of The Great Scrollsaw Project-Design Contest.

Print this article

Better Homes and Gardens®
WOOD®
THE WORLD'S LEADING WOODWORKING MAGAZINE
ISSUE NO. 80 AUGUST 1995

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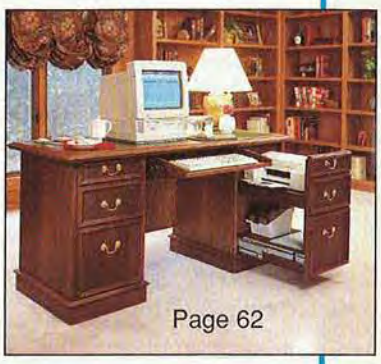

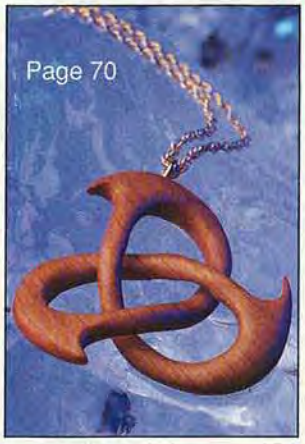

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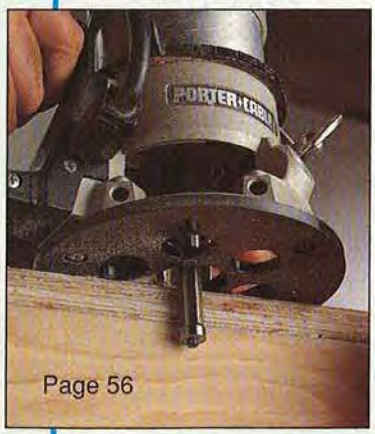

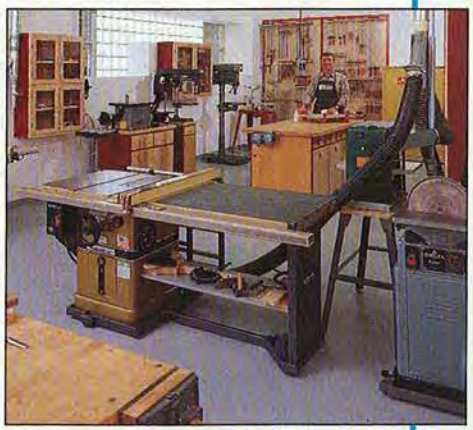

This issue's cover wood grain: Indian rosewood

IN ADDITION TO FURNITURE AND CABINETRY, IT'S ALSO QUITE GOOD AT BUILDING REPUTATIONS.

THE CRAFTSMAN PLUNGE ROUTER. IT HAS A 3 1/2 HP SLOW-START MOTOR TO ELIMINATE JUMPING. SIX DEPTH SETTINGS. ELECTRONIC SPEED CONTROL TO ADJUST TO WOOD HARDNESS. AND HANDLE-MOUNTED FINGERTIP CONTROLS. ADD TO THAT A SELECTION OF OVER 200 DIFFERENT ROUTER BITS AND ACCESSORIES AND YOU WON'T JUST BE WORKING WOOD, YOU'LL BE WORKING MIRACLES.

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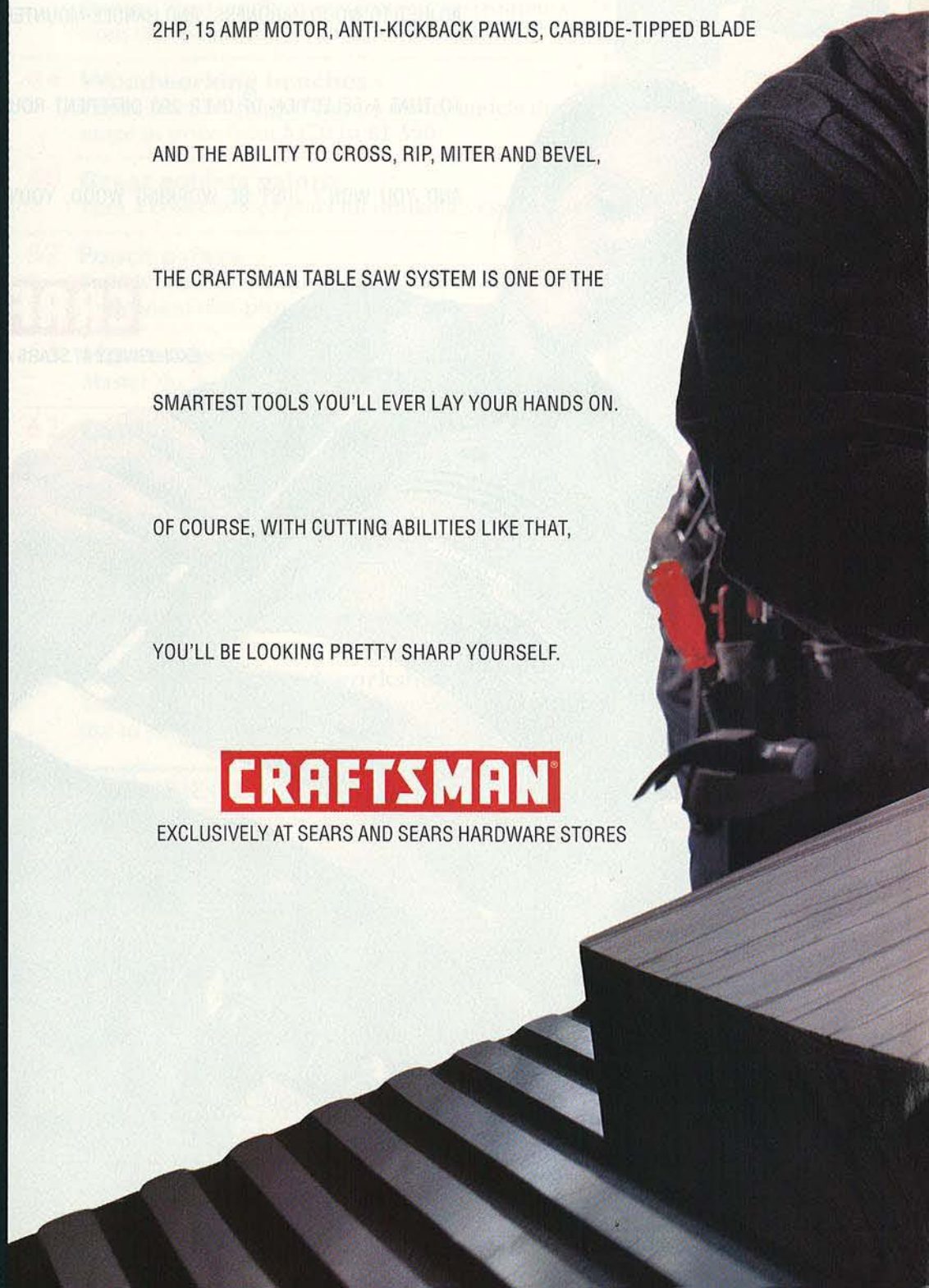

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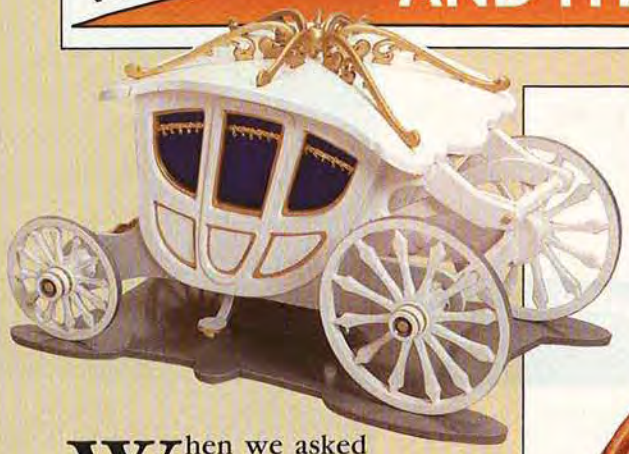
THE GREAT SCROLLSAW DESIGN CONTEST

AND THE WINNERS ARE



Neil Seely, grand prize winner

▲Grand Prize
$1,500
Neil Seely, Rochester, New York
Overall length: 13"

◀Put-Together Projects
$1,000
Kurt Lundberg, Anaheim, California
Overall height (with stand): 8"

▶Clever Cutouts
$1,000
Robin Wirtz, Tulsa, Oklahoma
Overall length: 35½"

◀Kids' Stuff
$1,000
Angie Medici, Des Moines, Iowa
Overall height: 14⅜"

▼Best Holiday Theme
$750
Kim and Rob Russell, Spring Green, Wisconsin
Overall height: big tree, 8"; small trees, 3½"

When we asked you to show us your best scrollsaw work, we figured we'd see some terrific things. But, the quality of the projects you entered in our Great Scrollsaw Design Contest far exceeded those expectations.

To judge such a great batch of designs, we called on *WOOD*® magazine Design Editor Jim Downing. He enlisted the help of two other people who know a lot about designing and scrollsawing:

- Christine Anderson, a West Des Moines, Iowa, artist and designer. Chris has designed projects for *WOOD* magazine and *WOOD* magazine's *SUPER SCROLLSAW PROJECTS™*. She also sells her whimsical painted furniture and decorated accent items through shows and galleries.
- Rick Hutcheson, a scrollsaw ace from Grimes, Iowa. Rick logs 10–12 hours a day cutting pieces for his gift shop, for other crafters, and for *WOOD* magazine, *SUPER SCROLLSAW PATTERNS*, and two of our companion magazines, *WEEKEND WOODWORKING PROJECTS*® and *DECORATIVE WOODCRAFTS*®.

Here are the five winners the judges selected.

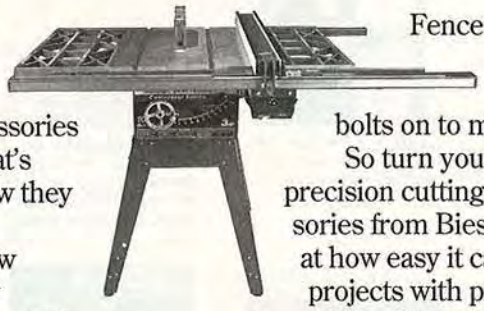
Our thanks to everyone who entered. Entries will be donated to the Build-A-Toy® contest auction this fall, where they will be sold to benefit the Toys for Tots program.

Photographs: King Au; John Hetherington

CAN YOU SPOT YOUR CRAFTSMAN TABLESAW IN THIS AD?

Maybe not. But it's there. All we've done is install Biesemeyer precision tablesaw accessories. However, it's not the way our accessories make your Craftsman saw look that's important. What's important is how they greatly improve the way it works.

Starting with the T-Square® Saw Fence System, you'll immediately appreciate how the hairline pointer and built-in tape enable you to make precision set-ups, cut after cut. When used in combination with our side and back extension tables you'll waste less time, and materials. And since the Saw Fence System pictured above has been engineered to fit Craftsman tablesaws, it bolts on to most with no drilling.



So turn your Craftsman tablesaw into a precision cutting instrument with accessories from Biesemeyer. You'll be amazed at how easy it can be to cut your homeshop projects with professional accuracy and safety. Biesemeyer products are available through the Craftsman Power & Handtool catalog and at over 530 professional Biesemeyer dealers throughout the U.S. and Canada. For the location of the dealer nearest you, call 1-800-782-1831.

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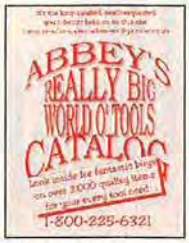

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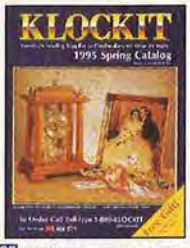

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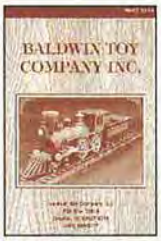

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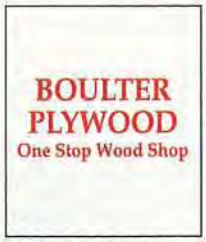

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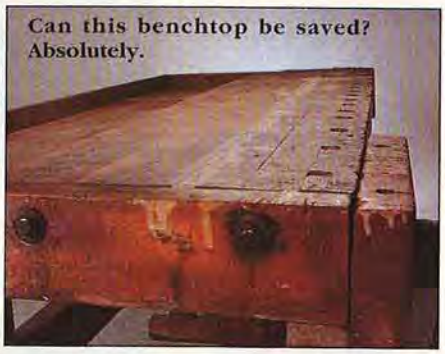
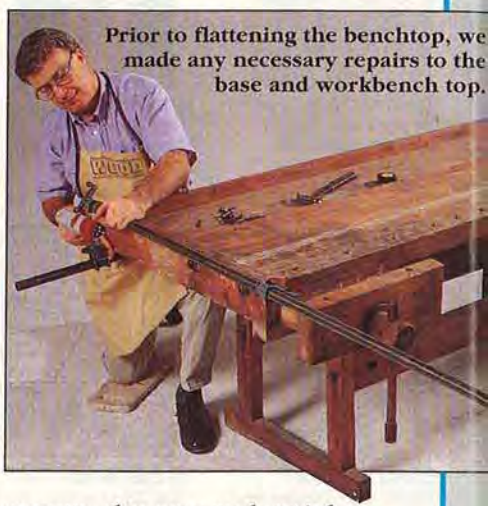
HOW TO FLATTEN AN UNEVEN WORKBENCH TOP

Shortly after assuming his duties as our new project builder, Chuck Hedlund made it a priority to flatten the benchtops in the *WOOD*® magazine shop. Why the rush? According to Chuck, "I find a flat work surface essential to assembling square boxes, flat panels, or four-legged projects that don't rock. I can't work on a benchtop that's not true." So, we've asked Chuck to show us the best way to level a troublesome benchtop. Here's how he does it.

Note: *These procedures work for any solid-wood top that's at least 1" thick. We recommend you flatten your benchtop if it's uneven by more than 1/32". (You can check for flatness by moving a straightedge across your benchtop.) Do not try these flattening steps on laminated tops made of plywood, particleboard, hardboard, or similar materials.*

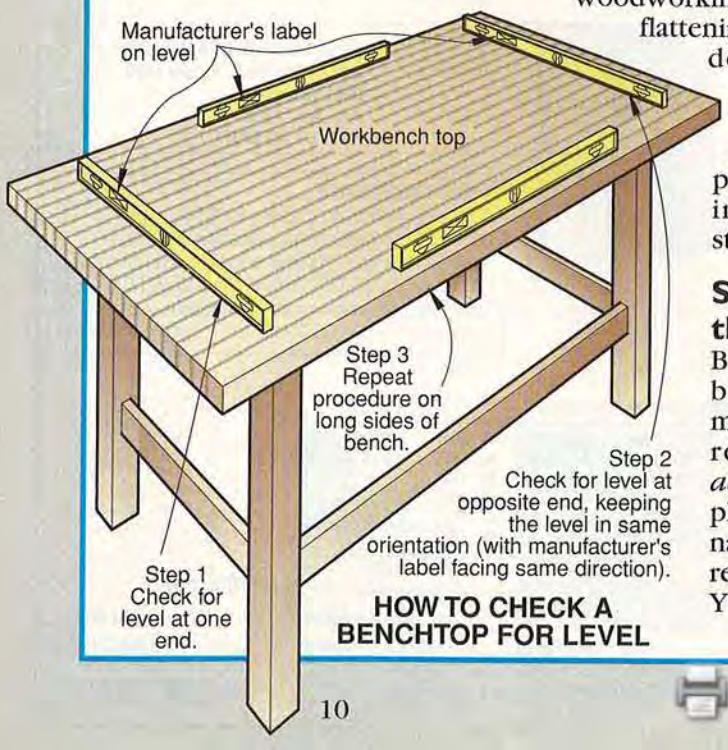


Can this benchtop be saved? Absolutely.



Prior to flattening the benchtop, we made any necessary repairs to the base and workbench top.

To show you how this technique works, we searched for a bench badly in need of flattening. We found a doozie in the workshop of John Hetherington, one of our photographers. As you can see *above*, this turn-of-the-century bench had a warped, irregular surface that was out of flat by more than ½". The bench was a great-looking antique, but John wanted to restore its usefulness as a woodworking tool. Although the flattening process that we'll describe here bared new wood on the benchtop, John restored the antique-patina look by rubbing in a combination of stains afterwards.


Manufacturer's label on level
Workbench top
Step 3 Repeat procedure on long sides of bench.
Step 2 Check for level at opposite end, keeping the level in same orientation (with manufacturer's label facing same direction).
Step 1 Check for level at one end.

HOW TO CHECK A BENCHTOP FOR LEVEL

Start by preparing the bench

Before you flatten the bench, you need to make any necessary repairs. As shown *above right*, our sample bench had delaminated edge boards that required our attention. You may have to remove the top and retighten, reglue, or reinforce the joints in the base to make it solid and rack-free.

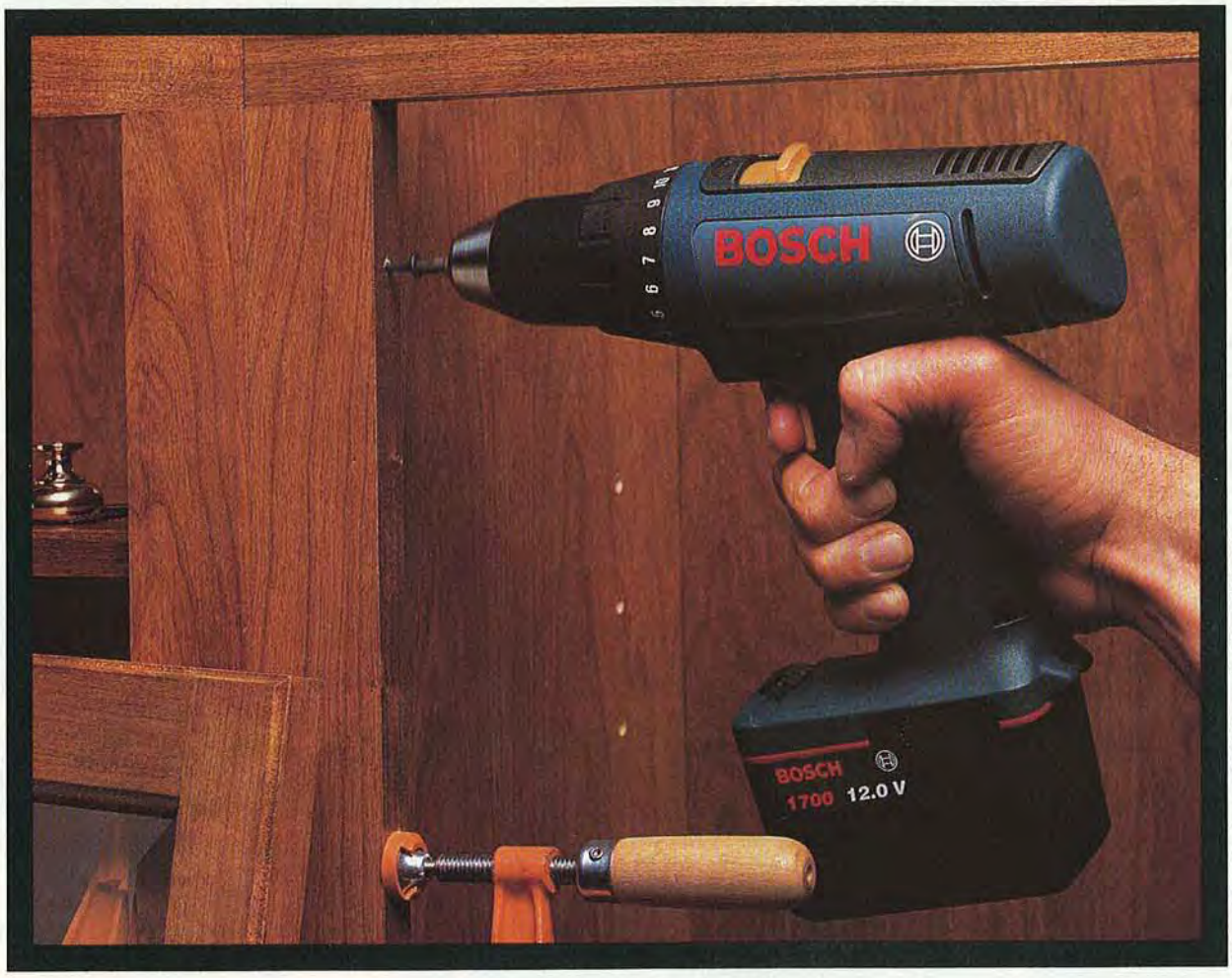
Since you will be routing into the top in the following steps, you need to remove any embedded metal fasteners (such as brads and staples). A metal sensor will aid your search, and save you from dulling or destroying a router bit.

Next, place the bench in the spot in your shop where you will be using it. Check the top for level, and add wood shims to the bottom of the base's legs as necessary (see the drawing *left*).

With the top as level as possible, attach the shims with adhesive or fasteners. Mark the position of each leg onto the floor so that you can always return the bench to its level location.

Continued on page 12

Print this article



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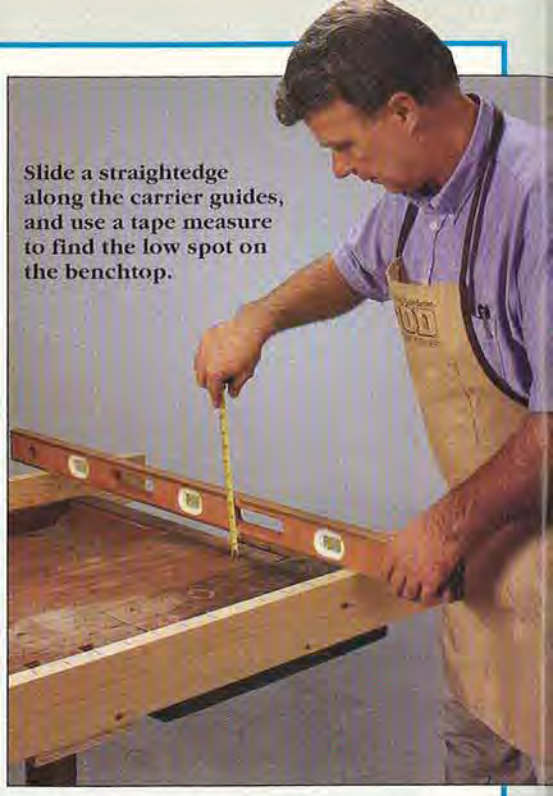
HOW TO FLATTEN AN UNEVEN WORKBENCH TOP

Continued from page 10


Slide a straightedge along the carrier guides, and use a tape measure to find the low spot on the benchtop.

Now, make and attach the flattening jig

With the jig shown in this article, you can slide a router over your benchtop to remove all the high areas and leave a flat surface. The router slides back and forth across the top in a *router carrier* that slides along a perfectly level and straight *carrier guide* on each side of the benchtop. These pieces are mounted to the bench with *carrier-guide supports.*

To mount the carrier guides and carrier-guide supports, follow the Setting Up the Carrier Guide drawing *below*. (You may find it necessary to remove one or more vises.) To make the carrier guides, joint one edge of a 2×4 and rip the opposite edge to give you a straight board with parallel edges.

After mounting the carrier guides, use a level to make sure that they are level along their length and level with each other. If the benchtop is twisted you may find it necessary to shim the carrier guides with thin pieces of wood or paperboard as shown in the Section View *below*. Use only as many shims as necessary.

Now, use another jointed board as long as the carrier guides to check them for straightness. If the carrier guides bowed during mounting, you will need to correct the situation with shims.

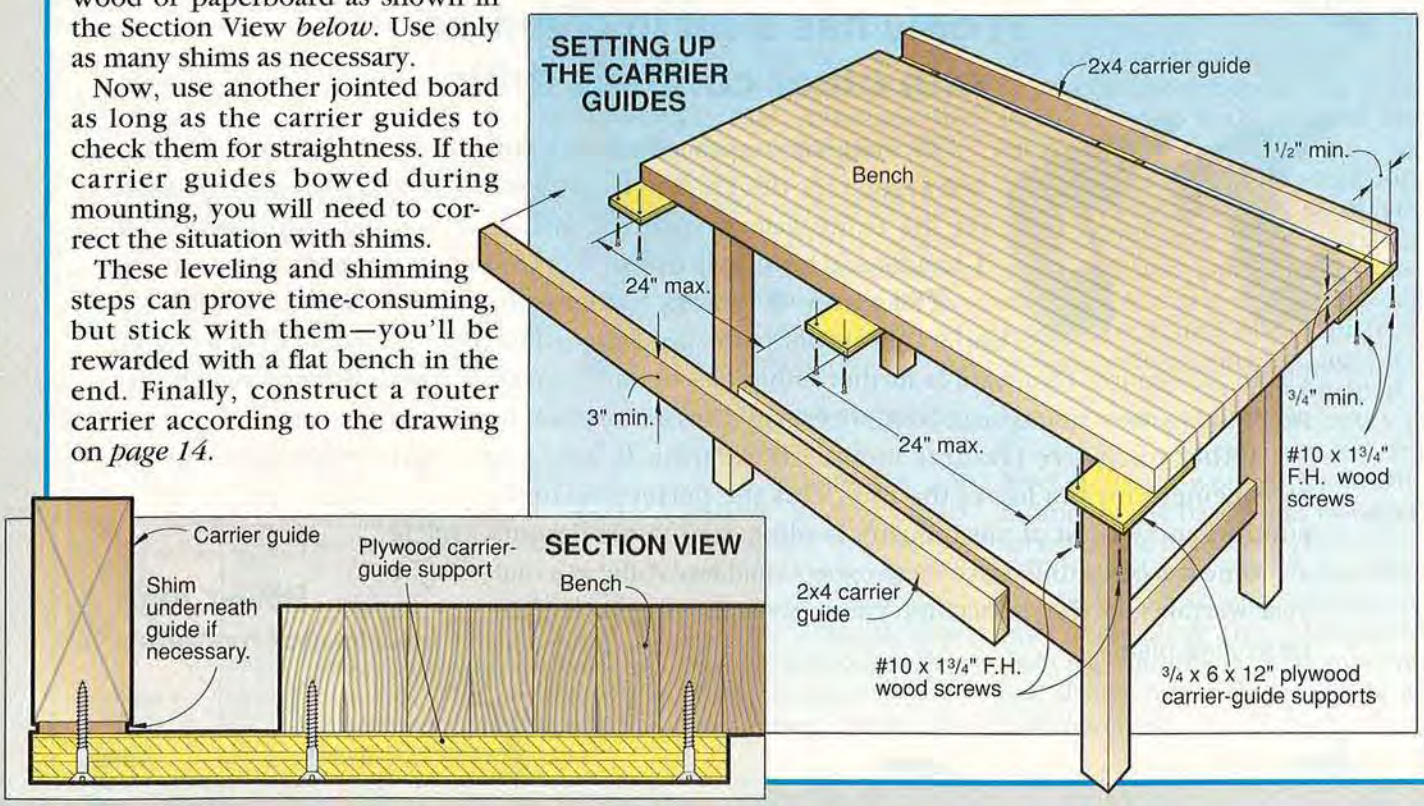
These leveling and shimming steps can prove time-consuming, but stick with them—you'll be rewarded with a flat bench in the end. Finally, construct a router carrier according to the drawing on *page 14*.

It's time to rev up the router and start flattening

To adjust your router's straight bit for the correct cutting depth, use a straightedge and tape measure as shown *right* to find the lowest spot on the bench. Then, place the router carrier onto the carrier supports so its slot centers over the low spot. Mount a 1"- to 1½"-diameter straight bit in your router, place the router into the router carrier (directly above the low spot), and set the bit for a paper-thin cut. You must securely tighten the router bit into its collet, and the router motor housing to the base, to eliminate any possibility of the cutting depth changing during the following steps.

Next, use four clamps to secure the router carrier to the carrier guides at either end of the bench. Make a full cut across the width of the bench by first running the router away from you and along the left hardwood side of the router carrier. Then, make a return cut toward you along the right side of the router carrier. Without moving the router carrier, repeat these router passes once or twice so the bit cuts to its full depth. As you move the router, remember to place minimal downward pressure on it to avoid bowing the router carrier.

Continued on page 14



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THIS SIDE OUT

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When we listen to woodworkers, we understand what you mean — after all, we are woodworkers! You told us you needed a dado to cut plywood, solid wood, hardwood veneered plywood, laminates and melamine *chip-free*. You told us that it needed to cut precise slots and maintain accuracy. And it especially needed to accommodate today's undersized plywoods.

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To make it even better, we added something no other dado manufacturer has...a sixth chipper that is $^{3}/_{32}$" thick. That doubles the number of possible slot widths (from $^{1}/_{4}$" up to $^{29}/_{32}$" wide), and allows you to set the dado to fit today's undersized plywoods. To make it even more flexible, we've included a set of precision steel shims for fine adjustments. Here is a dado that matches the slot width flexibility of an adjustable dado while maintaining the safety and finish of a stacked dado system.

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Circle No. 1321

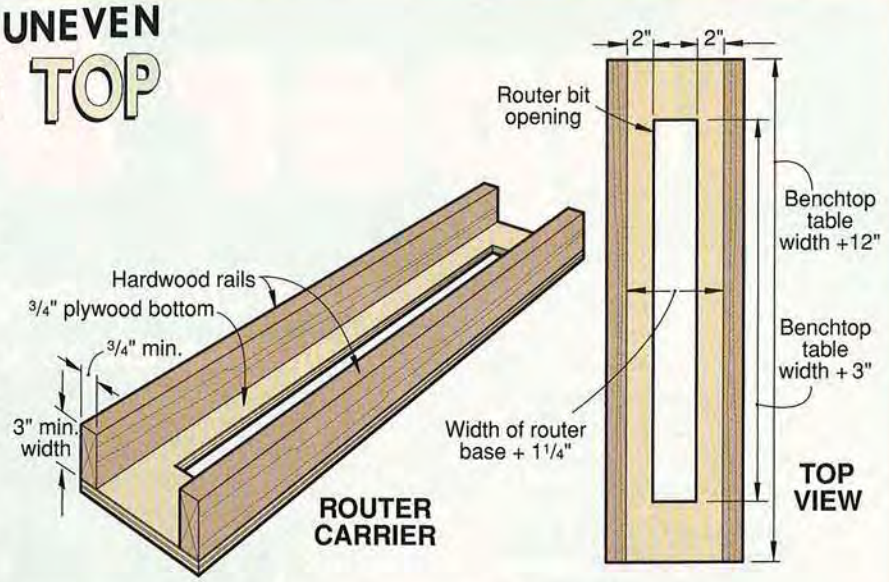
HOW TO FLATTEN AN UNEVEN WORKBENCH TOP

Continued from page 12

Repeat this procedure at three evenly spaced locations along the length of the bench as shown *below*. These cuts confirm that you adjusted the router bit to the correct depth. Adjust the bit for a deeper cut if it passes over any areas without removing stock. If the router bogs down during these cuts, switch to a smaller bit or a more-powerful router.

Now, measure the width of any of your four router cuts. Subtract ¼" from your measurement and use this figure to space out marks along the length of each carrier guide. For instance, our router cuts were 2¼" wide, so we made marks every 2". Use these marks in the following step to guide your placement of the router carrier so your cuts overlap by ¼".

Next, flatten the entire top by starting at either end of the bench and making router passes in increments along its length. For consistently deep cuts you must clamp the router carrier for each router cut. You can speed things along by having a helper reposition and reclamp one end of the router carrier while you clamp the other end and operate the router.



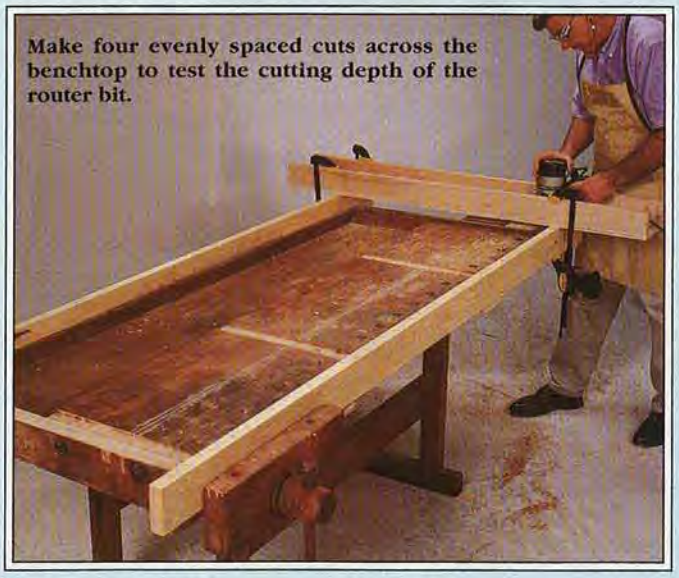
As you approach each of your intial, spaced-apart cuts, check to see that your cutting depth has not changed. If it changes, the bit or motor housing is slipping up or down, and you will need to fix the problem. In working on the benchtop shown here, we were tripped up by the brand-new router we were using. Factory lubrication on the outside of the motor housing was causing the housing to slip, even though we tightened the base securely. So, we cleaned the motor housing and base with mineral spirits, then started the routing process over again. Another lesson learned the hard way!

The final touches

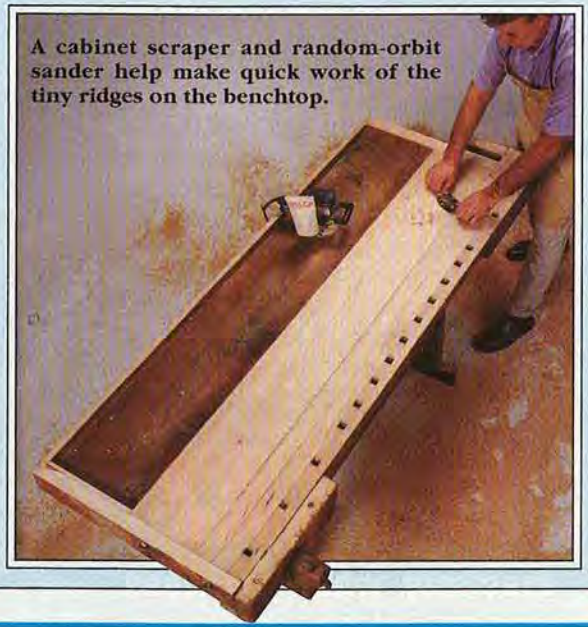
No matter how careful you were to clamp the router carrier and put minimum downward force on the router, you will still wind up with fine ridges where one router pass meets the other. Fortunately, you can quickly smooth away these ridges while keeping your bench flat.

As shown in the photo *below*, we lowered the ridges with a cabinet scraper and followed this with a light sanding using a random-orbit sander. Be careful to remove the ridges and no more.

Written by Bill Krier with Chuck Hedlund
Photographs: John Hetherington
Illustrations: Kim Downing



Make four evenly spaced cuts across the benchtop to test the cutting depth of the router bit.



A cabinet scraper and random-orbit sander help make quick work of the tiny ridges on the benchtop.

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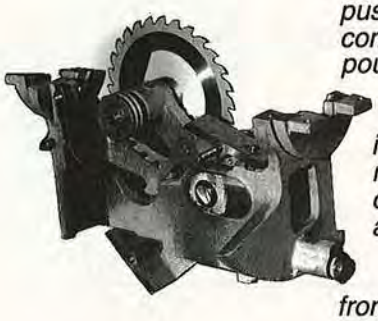

A second look wants you to notice the internal portion of the 66 - the "heart" of the machine. These are the features that push the 66 saw way ahead of the competition. The 66 weighs a hefty189 pounds more than our leading competitor!

Most of the difference can be found in our one piece, wide stanced cast iron trunnion. This heavy duty trunnion reduces vibration, ensures smoother cuts and is the primary reason for the accuracy of this superior saw.

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The third look is the one that separates Powermatic from the rest of the pack. It's the look of performance! There is only one way to determine the performance of the 66 saw and that is to try it. Push the button. Feel the awesome sense of power and notice the smoothness with which it runs. After you make that first cut, and experience the feel of cutting your workpiece perfectly, then, and only then, will you realize the model 66 industrial saw is truly superior to all others on the market.

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Circle No. 81

TALKING BACK

Print this article

We welcome comments, criticisms, suggestions, and even compliments. Send your correspondence to: Talking Back, *Better Homes and Gardens*® *WOOD*® Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379.
***CompuServe* address: 74404,3516 (or) Internet: 74404.3516@compuserve.com**

How wide is that side?

I want to build a six-sided project, and I found the Ask *WOOD* article "Figuring Angles for Many-Sided Objects" in the September 1993 issue of help. However, this doesn't address how to calculate the width of the sides of the project. Can you explain how to do this?

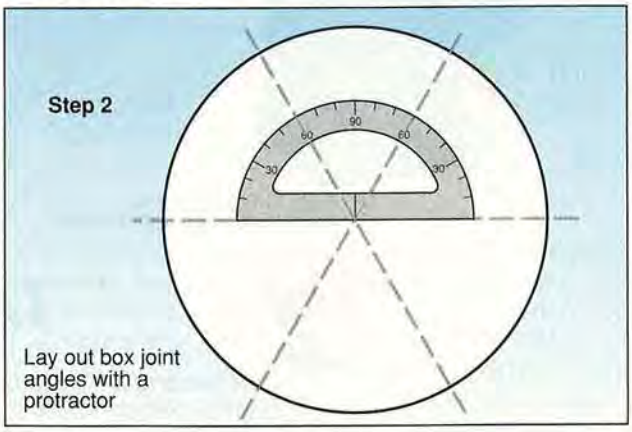
—Anthony J. Strand, Allentown, Pa.

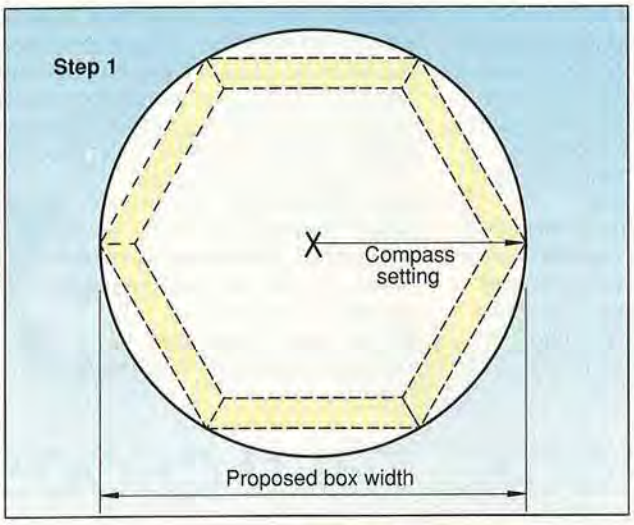
To do this, first make a full-sized or scale drawing of the project. Then measure the side width from the drawing. Here's how to lay out the drawing:

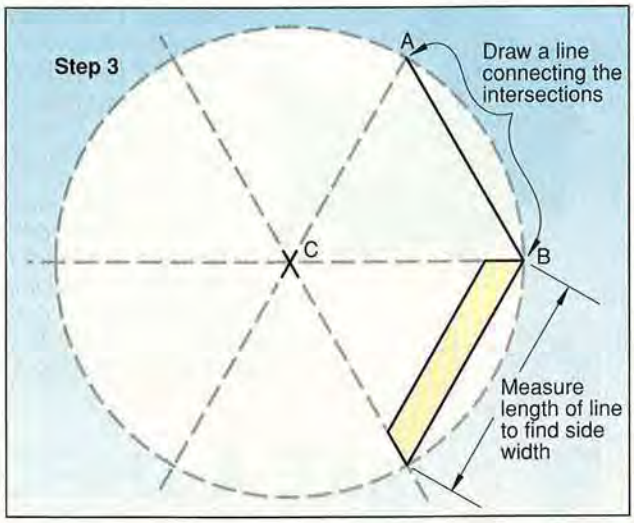
***1** Set the compass to a distance equal to a measurement from the center of the box to an outside point of a corner. (For example, to design a box that measures 8" across opposing outside corners, set the compass to 4"). Then, using this setting on your compass, draw a circle on your paper.*

***2** Divide 360° by the number of sides you want on the box. The answer will equal the number of degrees spanned by each side. (For 6 sides, this would be 60°.) Next, use a protractor to lay out lines from the center of the circle to the edge, with the lines separated by the degrees of span of each box side.*

***3** Draw a line (AB) from the point where one of the angle lines (CA) meets the circle to where its adjacent line (CB) meets the circle. Measure line AB to get the width (after miters are cut) of the sides of your box.*







How to transfer *WOOD PATTERNS*™

I like the full-sized pattern inserts that have been added to *WOOD* magazine. However, I am not sure of the best way to transfer the patterns from the sheet to my wood. Can you help?

Waldo J. Berg, Fargo, N. D.

There are several good ways to transfer these patterns. For smaller designs, take the WOOD PATTERNS™ *sheet to a copy machine, and make a 1-to-1 copy. For larger patterns, trace the lines directly from the sheet onto tracing paper.*

Then, fasten the tracing to the wood using spray adhesive or rubber cement. You also can transfer the pattern from the tracing to the wood by placing carbon paper between the pattern sheet and the wood and tracing over the lines with a pencil.

For designs that you expect to use a lot, make templates from ⅛" or ¼" plywood or tempered hardboard. Cut out these templates with your bandsaw or scrollsaw, sand the edges, and use them to trace the pattern onto your wood, or use as a guide for a flush-trimming router bit.

Continued on page 18

Craftsman's Most Powerful Vac... Wet or Dry

With six peak horsepower, Craftsman's new wet/dry vac is the most powerful, detachable blower vac on the consumer market.

It's at home in your workshop, kitchen, garage... even in the yard, thanks to the detachable blower that cleans up leaves and yard debris with a 200 MPH blowing velocity.

To complement its power, we developed a sturdy vac caddy supported by oversized wheels to resist vac tipping. There's an extra-long 20-foot cord and convenient on-board accessory storage so tools are always right at hand. The large 16-gallon capacity, built-in drain and reusable filter make cleanup a breeze. Accessories include two extension wands, four nozzles, blowing diffuser and blower adapter.

Check out this new detachable blower vac with 6 peak horsepower at your Sears store, or for convenience, call the "Sears Shop at Home" service, 1-800-377-7414.

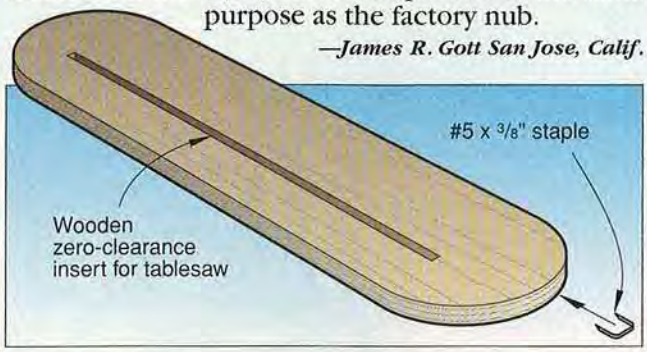
TALKING BACK

Continued from page 16

Back to the safer insert

I have an addition to the Ask *WOOD*® article "A Safer Insert" in the November 1994 issue. In the past, I have made several zero-clearance inserts for my Delta contractor's tablesaw. Not long ago, though, I noticed that the factory saw-blade insert has a small nub on the back edge that fits under a lip in the table opening. This prevents the insert from lifting at the back. I added this safety device to my inserts by tapping in a #5 × ⅜"-long staple, centered along the edge at one end, leaving it protruding ⅛". With this addition, I can still remove my insert from the front, but the staple serves the same purpose as the factory nub.

—James R. Gott San Jose, Calif.



How to reverse iron-on transfer images

In the November 1994 Talking Back article "A hot solution for transferring patterns," this technique reverses the image when the photocopy is ironed onto the wood. Consequently, this does not work for lettering or asymmetrical patterns. Here's a way to work around that problem:

1 Photocopy the original image onto clear acetate—an inexpensive material intended for use with photocopiers and available at most office-supply stores.

2 Photocopy the acetate (with its printed side up) onto a plain sheet of paper.

3 This paper copy will have a reversed image. Place this sheet face down on the wood, and lightly press it with a hot iron to transfer the ink from the paper to the wood.

—Jack Moreland, Royal Oak, Mich.

Continued on page 21

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G2416	1¾"	$ 9.95	$ 7.96	BOX OF 2500
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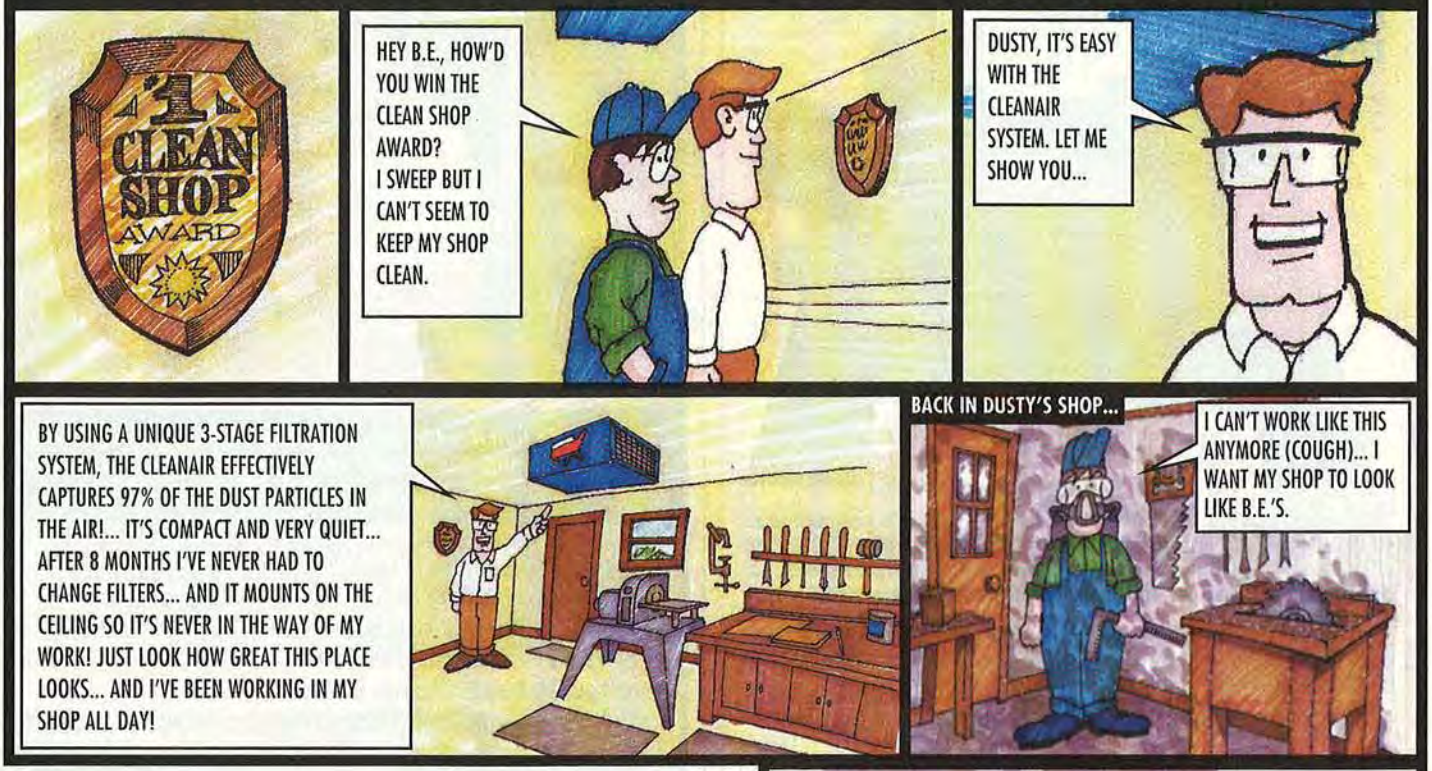
The Adventures of Dusty Pyles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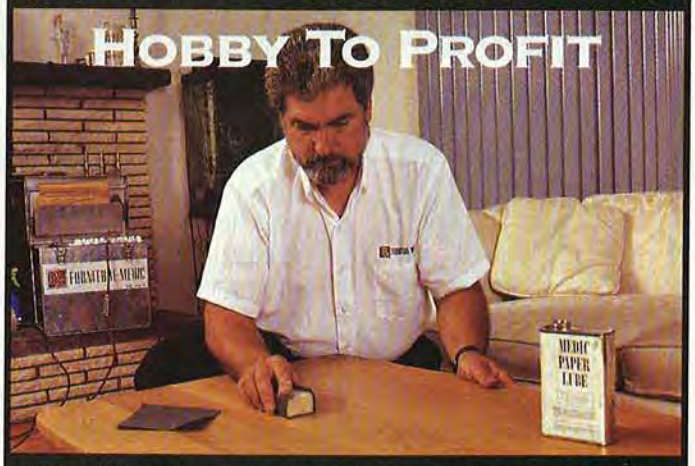

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TALKING BACK

Continued from page 18

The case of the missing fractions

We have once again suffered from a disagreement between computers. This time the error crept into our *WOOD PATTERNS™* for the June 1995 issue. On the pattern for the Easy Glider back slats, everywhere you see the symbol ø please substitute the fraction 11/16". Also, the 5/32" screw hole dimension in the Radial-Arm saw-stop part B was omitted from this pattern sheet. We apologize for any inconvenience this may have caused you.

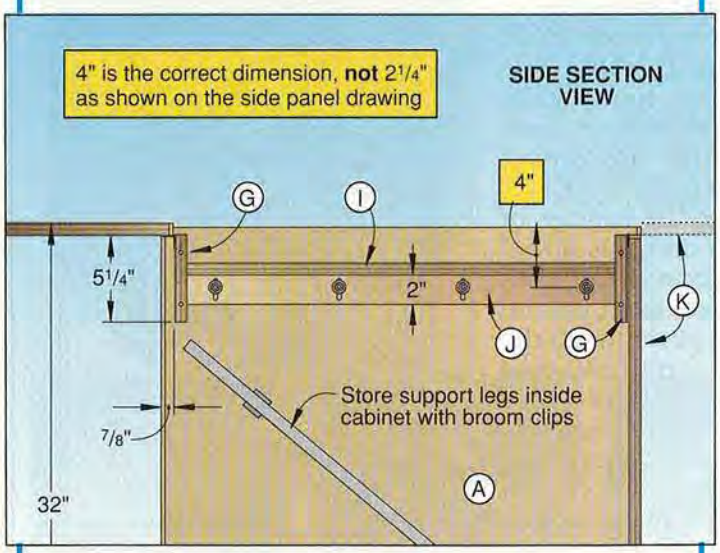
As the Watco turns

In the last issue we reported that Watco Danish Oil Finish had been pulled off the market by its parent company, Minwax. We've now learned that The Flecto Company recently acquired the Watco brand. The product should be back on shelves by the time you read this. Flecto plans no changes to the formula, and few package or labeling changes. For more information call Flecto at: 800/635-3286.

—Bill Krier, Assistant Managing Editor

Portable planer stand widens out

Several readers who own a Delta 12" planer have noted that the 20¼"-wide platform of the planer stand featured in the January 1995 issue is about ⅜" too narrow to fit this machine, and they've had to mortise the side panels (A) to make them fit. Before building the portable planer stand, measure the overall width of your planer, and make the interior width of the stand 1" wider. If you've already built the stand, and your planer won't fit, cut notches in the side panels. Neither change will affect the structural integrity of the project. Also, locate the four holes in each side panel (A) 4" from the top edge of the panel as shown in the Side Section View *(below), not at the 2¾" mark as shown in the Side Panel drawing in the article.*



How I Turned My Hobby Into A Successful Craft Business.

With The Help Of My RBI HAWK Scroll Saw.

When Susan Baily first considered starting her own craft business, she knew to produce the type of unique crafts customers would pay top-dollar for she needed to work with the best materials.

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With her RBI Hawk Precision Scroll Saw, she now produces the woodworking projects she has always dreamed of creating.

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Susan applying the final touches to one of her inspired creations.

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To produce wood to just the right dimension for her patterns, Susan and her husband decided to buy an RBI 812 "3-in-1" Universal wood-planer system. Now she even sells these pre-cut patterns to area craft stores and her own customers.

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Circle No. 84

TIPS FROM YOUR SHOP (AND OURS)

Does your shop vacuum sometimes stick to the floor?

I really appreciate my shop vacuum—until the floor nozzle sucks itself down so tight that I have to yank it free. But a few months ago, reader Danny Regans sent in a simple solution to this problem at *right*, and earned himself the top shop tip prize for this issue.

Within days of my writing about this tip, though, several people said they had the idea first. I don't doubt their claims, but he (or she) who puts a tip on paper and gets it into my office first gets the credit. The moral to the story: When thinking about shop tips don't overlook ordinary improvements, and never assume your idea rates as old news.

If we choose your tip, we'll pay you $40, plus you may win a new tool for the top tip. Just send a description of the idea and a drawing or photo to:

Tips From Your Shop
(and Ours)
***WOOD*® Magazine**
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We try to publish original shop tips, so send your idea to only one magazine. Also note that we cannot return your submissions. Thanks!

Tom Jackson
General-Interest Editor

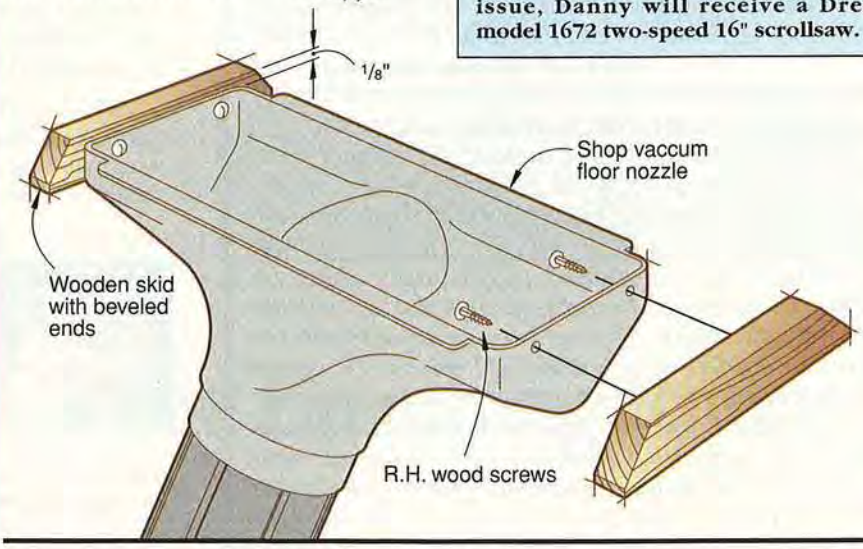
Skids make floor cleaning easier with shop vacuum

For a quick and simple way to improve the operation of your shop vacuum, try raising the height of your floor nozzle by screwing a pair of skids to its sides. Position the skids so that they hold the bottom of the nozzle about ⅛" off the floor. With the skid raised, the floor nozzle won't stick to the floor or push around larger woodchips. You can make the skids out of any solid wood. Bevel the ends so that the blocks don't hang up on any small bumps in the floor.

—Danny Regans, Charlotte, N.C.

TOP SHOP TIP

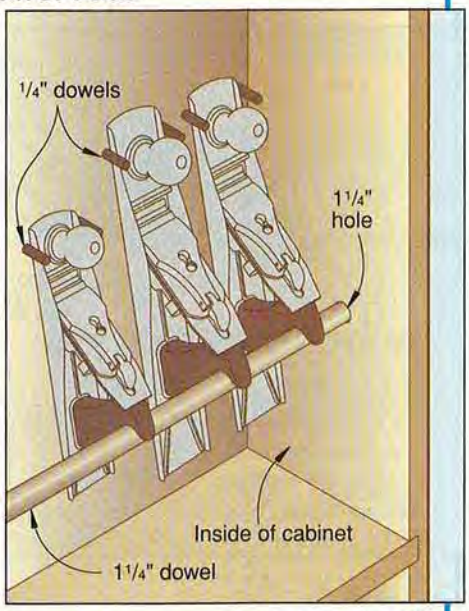
For submitting the top shop tip in this issue, Danny will receive a Dremel model 1672 two-speed 16" scrollsaw.



Hang your bench planes on dowel rods

Here's a quick-and-easy way to store your bench planes in an upright position. Install a 1¼" dowel or closet rod horizontally between two cabinet or shelf uprights. Position the dowel about 4" from the back of the cabinet or wall. Place the handles of the bench planes over this dowel as shown. To keep the planes from tipping over, mark where the sides of each plane touch the back wall. Then, drill holes and insert ¼×1½" dowels in these locations. If the back of your wall includes perforated hardboard, simply install pegboard hooks on both sides of each plane to prevent tipping.

—from the **WOOD** *magazine shop*



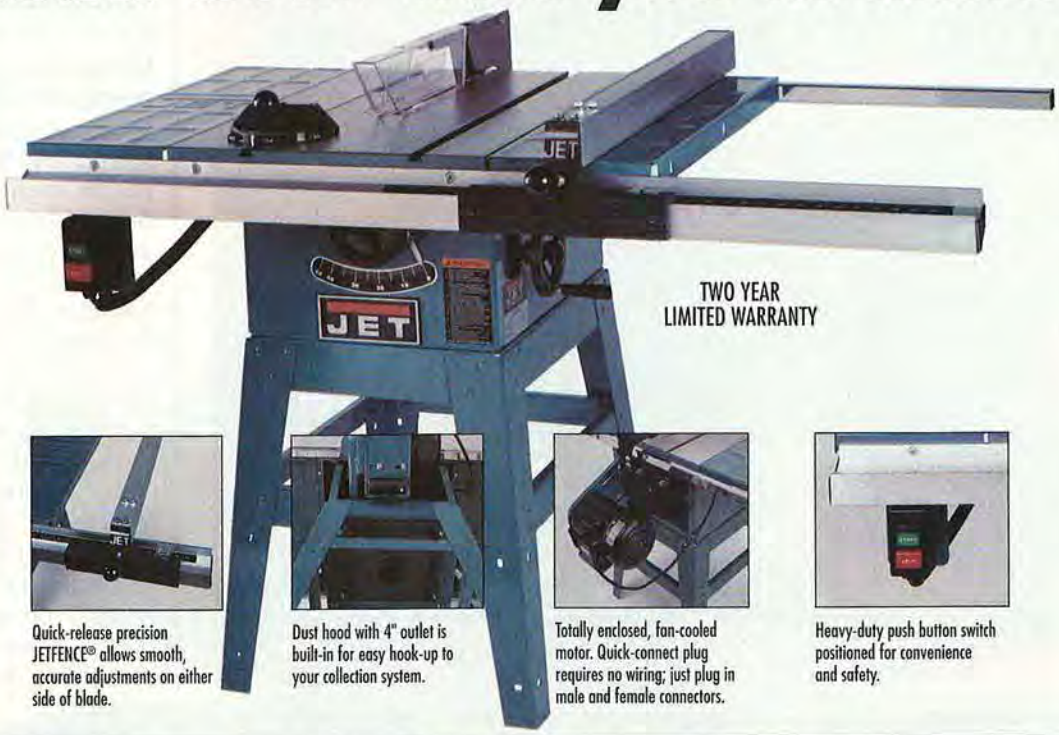
Continued on page 24

Print this article

A tablesaw built with you in mind

During the two years we spent designing our totally **NEW** 10" tablesaw, we asked woodworkers like yourself what features they wanted in a saw.

This is what they told us.



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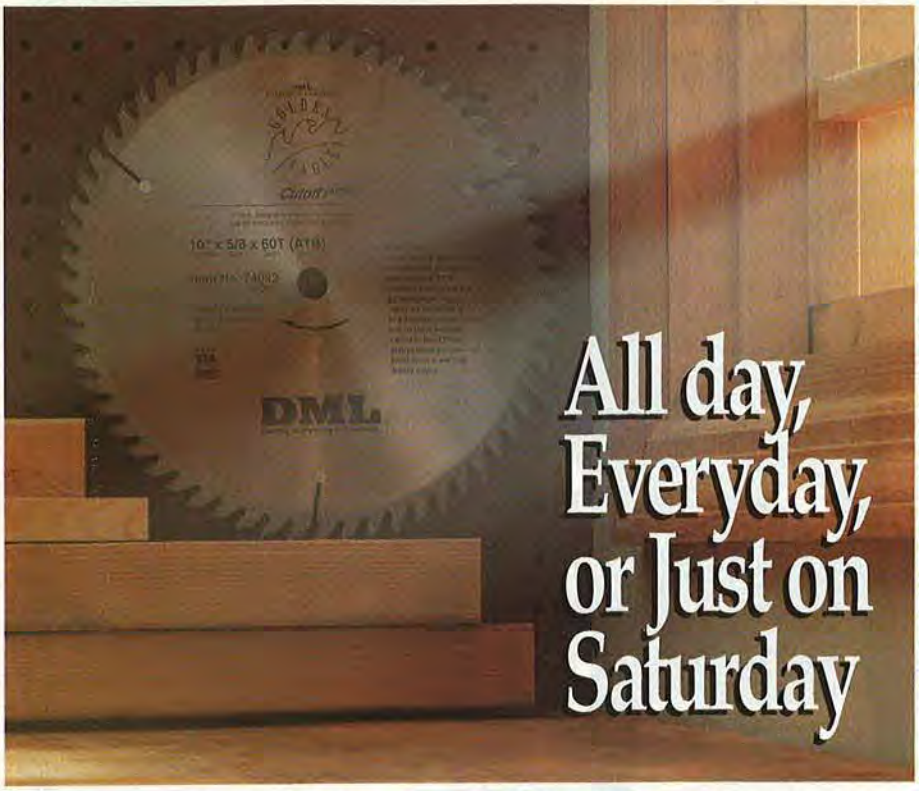

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Circle No. 610

TIPS FROM YOUR SHOP (AND OURS)

Continued from page 22

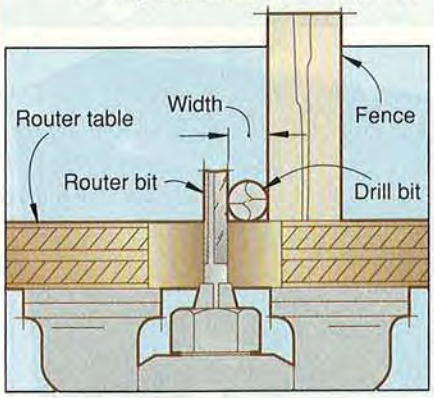
Drill bits provide perfect measurements

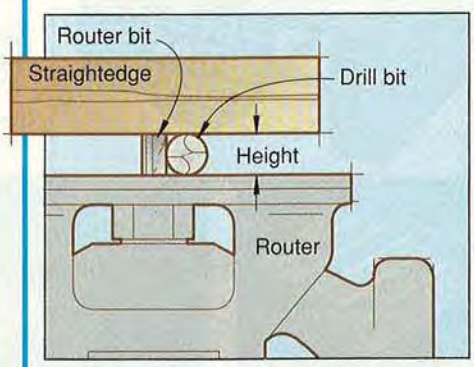
When setting the distance from a router bit to the fence on your router table, a drill bit can often provide you with a more accurate measurement than any ruler in your shop. For example, when you need a ¼" space, simply hold the shank of a ¼" twist-type drill bit against the router bit, as shown *below*, and move the fence in until the drill bit fits snug against both surfaces.

Don't, however, push the fence in so tight that you can't remove the drill bit. Rather, adjust the fence until the drill bit drags lightly on both the router bit and the fence when you withdraw it (much like using a spark-plug feeler gauge).

You also can use this technique for setting the height of a router bit. Place a straightedge across the top of the bit, as shown *bottom*, and adjust the height of the router bit until the drill bit fits snugly between the router base or tabletop and the straightedge.

—Ed John, South Sioux City, Neb.





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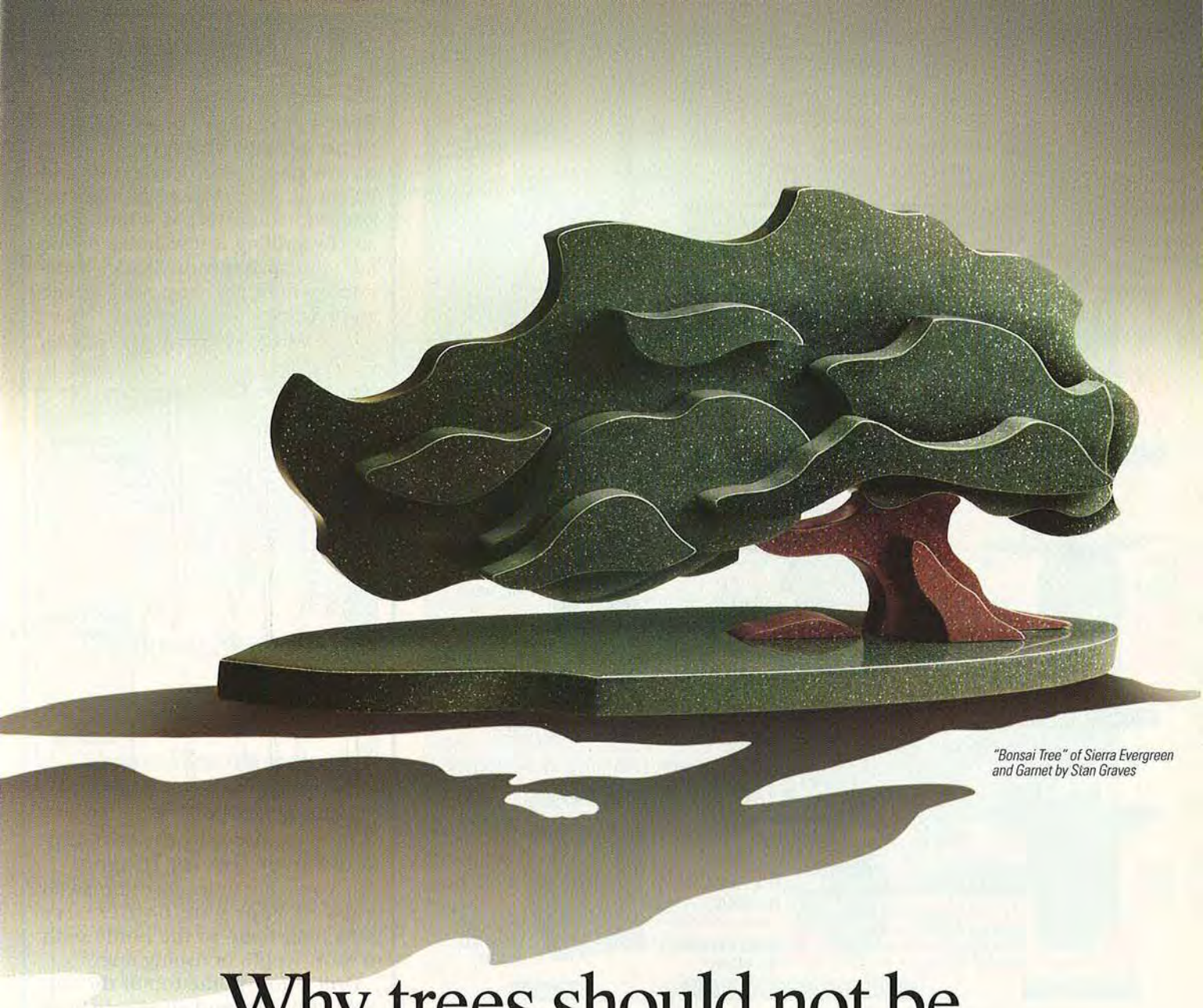

"Bonsai Tree" of Sierra Evergreen and Garnet by Stan Graves

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14" BAND SAW

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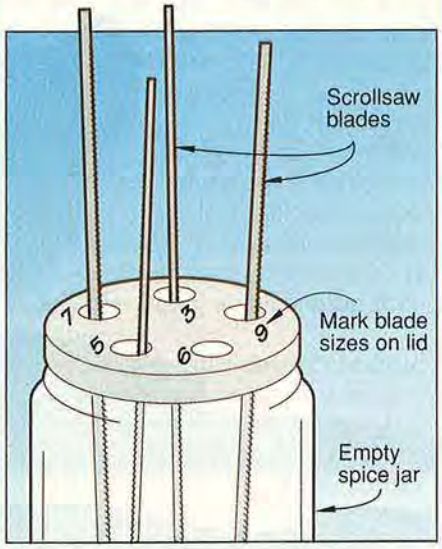
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 24

Store scrollsaw blades in an empty spice jar

If you have trouble storing and retrieving scrollsaw blades, try keeping them in a 4"-high spice jar. By drilling a few holes in the lid, you can keep the blades separated where they are easy to see and retrieve.

—Frieda Dekker, Nobleford, Alta.



Tie on your glue-bottle cap and never fish for it again

Do you sometimes lose the small caps to your glue bottles? Try attaching them to the bottle with a short length of fishing line.

Drill a hole in the top of the cap and run one end of the fishing line through the hole. Tie this end in a knot. Tie the other end of the fishing line around the neck of the bottle with a square knot and you're set.

—Edward White, Torrance, Calif.

Continued on page 28

Business owners at one of the regular August West training workshops.

Earn $1,000 a week in your spare time.

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August West will show you how to clean and maintain chimneys and flues using our state-of-the-art equipment and field proven techniques.

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3 service calls	=	$230 Fri
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		$1,040 weekly

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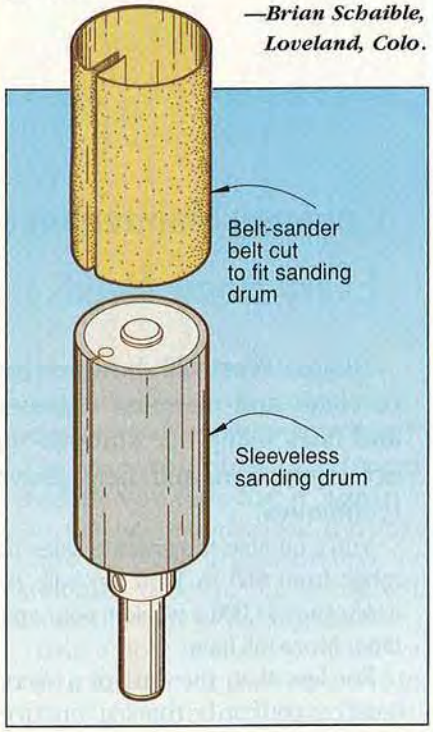
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 26

Cut up old sanding belts for use on sleeveless drums

The next time you tear or damage one of your sanding belts, don't toss it—recycle it. If the grit on the sanding belt still has some life left in it, cut the belt into pieces that fit on your sanding drums. The cloth-backed belts hold up longer than the thinner sandpaper normally used on these drums. With the recycled belts, you'll spend more time sanding and less time changing torn sandpaper on the drum.

—Brian Schaible, Loveland, Colo.



A FEW MORE TIPS FROM OUR WOODWORKING PROS

- When you turn a hollow vessel between centers, try the skew chisel for end-grain hollowing. See *page 51* for details.
- Want a beautiful finish for turnings that dries almost instantly? It's all in Great Goblets Galore on *pages 50-51*.
- For a nifty Art Deco accent, make one of the shell-shaped Corian sides for the napkin holder on *page 75*.

BOSCH

1003VSR	3/8" VSR DRILL W/KEYLESS CHUCK	88
1194VSR	1/2" VSR, 2 STAGE HAMMER DRILL	139
1272D	3" X 24" DUSTLESS BELT SANDER	209
1273D	4" X 24" DUSTLESS BELT SANDER	214
1273DVS	4" X 24" VS DUSTLSS BELT SANDER	229
1370DEVS	6" VS DSTLS RNDM ORB SNDR	234
1584VS	CLIC BARREL HANDLE JIG SAW, VS	148
1584VSA	1584VS JIG SAW W/CASE	168
1584VSB	1584VS JIG SAW W/CASE & 20 BLADES	182
1584DVS	BARREL HANDLE JIG SAW, DUSTLS	193
1587VS	TOP HANDLE JIG SAW, VARSP	148
1587VSA	1587VS JIG SAW W/CASE	168
1587VSB	1587VS JIG SAW W/CS & 20 BLADES	182
1587DVS	TOP HANDLE JIG SAW, DUSTLESS	193
1604	1 3/4 HP ROUTER	142
1608	LAMINATE TRIMMER	97
1609KX	DELUXE INSTALLERS KIT W/4 BASES	229
1613EVS	2 HP VAR SP PLUNGE ROUTER	197
1613EVSK	1613EVS 2W/RA1051 EDGE GUIDE	218
1614EVS	1 1/4 HP VAR SP PLUNGE ROUTER	159
1615EVS	3 1/4 HP VAR SP PLUNGE ROUTER	289
1615EVSK	1615 EVS W/RA1051 EDGE GUIDE	309
3051VSRK	9.6V CRDLS KIT W/2 BATT KEYLESS	139
3054VSRK	12V CORDLESS KIT W/2 BAT, CASE	168
3283DVS	5" VS DUSTLESS RANDOM ORBIT	95
3283DVSK	INCLUDES CASE, SANDER & ACCESSRS	119
B7000	TRIANGULAR CORNER SANDER	69
B7000A	B7000/W 10 PCS PAPER, EXTENDER & POLISH PAD	84
B7001	VAR SP CORNER SANDER	89
B1650K	*NEW* PLATE JOINER KIT	159
B2300K	12V CORDLESS DRILL KIT W/2 BAT	174
B4050	*NEW* IN LINE GRIP JIGSAW	113

Jorgensen

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3712	12"		6.50	35.00
3718	18"		6.95	37.75
3724	24"		7.95	42.50
3730	30"		8.80	47.75
3736	36"		9.95	53.95

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22-540	12" BENCH TOP PLANER	389
28-180	BENCH TOP BAND SAW	158
31-460	4" BELT/6" DISC SANDER	127
34-182	TENONING JIG	84
37-070	*NEW* 6" VS BENCH JOINTER	258
40-560	16" SCROLL SAW, 2 SPEED	184

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AT64	16 GAUGE FINISH NAILER 1" - 2 1/2" CAP	184
AT550S	1 1/2 HP SHUTTLE COMPRESSOR	269
AT550T	1 1/2HP TWIN TANK COMPRESSOR	289
AT550P	1 1/2 HP PANCAKE COMPRESSOR	289
AT800T	2 HP TWIN TANK COMPRESSOR	409

HITACHI

C8FB2	8 1/2" SLIDE COMPOUND MITER	574
C10FS	NEW 10" SLIDE COMPOUND MITER SAW	745
M12V	3 HP VAR SPEED PLUNGE ROUTER	235
NT45A	18 GA. FINISH NAILER W/CASE	289
NV83A	FULL HEAD CONSTRCTN COIL NAILER	429
P20SB	3 1/4" PLANER, 3.4 AMP	92
TR12	3 HP PLUNGE ROUTER	192

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60	8" LONG BED JOINTER	1695
63	ARTISAN 10" TABLE SAW W/26" VEGA	674
66	3 HP, 1 PH 10" T.A. SAW W/50" FENCE	1895
66	5 H P, 1 PH 10" T.A. SAW W/50" FENCE	1995
73	1 1/2 HP DUST COLLECTOR	394

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TXE150	6" VS DSTLS RANDOM ORBIT SANDER	138
BSPE100	TOP HANDLE JIG SAW, VS W/CASE	155
FSPE100	BARRELHANDLE JIG SAW, VS W/CASE	155

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100	7/8 HP ROUTER	$102
310	PRODUCTION LAMINATE TRIMMER	145
314	4 1/2" TRIM SAW	135
315-1	7 1/4" BUILDERS SAW	117
330	SPEED BLOCK FINISHING SANDER	60
330K	330 WITH CASE & 2-10 YD ROLLS PAPER	94
332	QUIKSAND 5" RNDM ORB W/STIKIT PAD	66
332K	332 W/CASE & 100 SHEETS PAPER	92
333	QUIKSAND W/HOOK & LOOP, DUSTLS	73
333K	333 W/CASE & 50 SHEETS PAPER	99
334	QUIKSAND W/STIKIT, DUSTLESS	73
334K	334 W/CASE & 100 SHEETS PAPER	99
340	1/4 SHT FIN SANDER W/DUST P/U	49
340K	340 WITH CASE & 10 SHEETS PAPER	72
345	SAW BOSS 6" CIRCULAR SAW	104
347	7 1/4" FRAMERS SAW 15 AMP, 10.25 LBS	127
351	3" X 21" BELT SANDER	148
351K	351 W/ 10 ASST BELTS & BELT CLNR	158
352	3" X 21" BELT SANDER W/DUST BAG	151
352K	352 W/10 ASST BELTS & BELT CLEANER	161
9352VS	3" X 21" VS DSTLS BELT SANDR W/CSE	165
9352VSK	9352VS W/10 ASST BELTS & BELT CLNR	175
360	3" X 24" BELT SANDER W/DUST BAG	189
360K	360 W/10 ASSORTED BELTS & BELT CLNR	200
361	3" X 24" BELT SANDER	182
361K	361 W/10 ASST BELTS & BELT CLEANER	193
362	4" X 24" BELT SANDER W/DUST BAG	195
362K	362 W/10 ASST BELTS & BELT CLEANER	208
363	4" X 24" BELT SANDER	191
363K	363 W/10 ASST BELTS & BELT CLEANER	204
410	UNDERSCRIBE LAMINATE TRIMMER	148
411	MITER FOLD LAMINATE TRIMMER	165
447	7 1/4" FRAMERS SAW W/BRAKE 15 AMP	137
505	1/2 SHT FIN SANDER	123
505K	505 W/CASE & 2-10 YD ROLLS PAPER	159
511	CYLINDRICAL LOCK INSTALLATION KIT	139
550	NEW POCKET CUTTER	178
556	BISC JOINER W/CASE & TILT FENCE	138
556K	SAME AS ABOVE W/1000 BISCUITS	160
690	1 1/2 HP ROUTER W/1/4" & 1/2" COLLETS	132
690K	690 W/CS, EDGE GUIDE, & TEMP GD KIT	179
9690	1 1/2 HP ROUTER W/CASE	144
691	1 1/2 HP "D" HANDLE ROUTER	148
691K	691 W/CASE, EDGE GD & TEMP GD KIT	204
693	PLUNGE BASE ROUTER, 1 1/2 HP	169
695	SHAPER TABLE W/ 1 1/2 HP ROUTER	216
696	SHAPER TABLE	128
743	7 1/4" FRAME SAW, 15 AMPS	128
843	7 1/4" FRAME SAW, 15 AMPS	138
2620	3/8" VSR DRILL, 0-1200 RPM W/CHK	88
2621	3/8" VSR DRILL, 0-1200 RPM, KEYLESS	89
5008	DOVETAIL TEMPLATE	78
5009	MORTISE & TENON JIG	47
5116	OMNI JIG	253
6931	PLUNGE ROUTER BASE	73
7116	NEW 24" OMNIJIG	293
7310	LAMINATE TRIMMER, 5.6 AMP	88
7312	OFFSET TRIMMER	127
7319	TILT BASE TRIMMER	99
97335	5" RANDOM ORBIT SANDER, VS W/CSE	132
7335K	7335 W/CS, DUST EX SYS, 100 SHTS PPR	165
97336	6" RANDOM ORBIT SANDER, VS W/CSE	137
7336K	7336 W/CS, DUST EX SYS, 100 SHTS PPR	169
73333	RANDOM ORBIT DUST EXTRACTION	24
7518	3 1/4 HP FIXED BASE ROUTER-5 SPEED	267
7519	3 1/4 HP FIXED BASE ROUTER-1 SP	233
7536	2 1/2 HP FIXED BASE ROUTER	202
7537	2 1/2 HP FIXED BASE "D" HNDL RTR	208
7538	3 1/4 HP PLUNGE ROUTER-1 SPEED	235
7539	3 1/4 HP PLUNGE ROUTER-5 SPEED	269
7549	TOP HANDLE BAYONET SAW	134
7549K	7549 W/CASE & 10 BLADES	152
7649	BARREL GRIP BAYONET SAW	147
7700	NEW 10" LASERLOC MITER SAW	338
7800	DRYWALL SANDER	329
7810	POWER TOOL TRIGGERED WET/DRY VAC	252
9118	PORTA PLANE KIT W/CASE, CRBD BLD	209
9314	4 1/2" TRIM SAW KIT	152
9315	7 1/4" BUILDERS SAW KIT	139
9345	SAW BOSS 6" CIRCULAR SAW KIT	123
9347	7 1/4" FRAMERS' SAW W/STEEL CASE	138
9637	TIGER SAW VAR SPD RECIP SAW KIT	144
9647	TIGER CUB RECIP SAW KIT	119
9743	7 1/4" FRAME SAW KIT, 15 AMPS	140
9853S	12V CRDLS KIT W/2 BAT, CASE	169
97310	LAMNT TRIMMR KIT W/4 BASES & CS	194

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EY6100CQKW	12V CORDLESS VSR KIT W/2 BAT, CASE & 15 MIN CHARGER & FLASHLIGHT GIFT PACK	204
EY6207EQK	1/2", 12V CORDLESS DRIVER/DRILL W/BATTERY & CASE	235
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0350SK	15 & 16 GA. FINISH NAILER 3/4"-2" W/CASE & 5000 ASSORTED BRADS	194
0565T	ANGLE FINISH NAILER 1"-2 1/2"	204
0626SK	NARROW CROWN 1/4" STAPLER 1/2"-1" WITH CASE & 5000 STAPLES	104
0645S	NARROW CRN 1/4" STAPLER 3/4" - 1 3/4"	189
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DA391DW	9.6V ANGLE DRILL KIT	175
6211DWE	12V KIT W/2 BATTERIES	175
5007NBK	7 1/4" CIRC SAW W/CASE & BLADE	129
LS1011	10" COMPOUND MITER	518
LS1211	12" COMPOUND MITER	849
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BO5001	5" RANDOM ORBIT SANDER	69
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2736-04	12V VSR CORDLESS DRILL KIT	145
3400	10" TABLE SAW W/CARB BLADES & ST PAD	189

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DW420	5" RANDOM ORBIT SANDER, PSA	69
DW421	5" DSTLS RNDM ORB SANDER, VELCRO	79
DW430	3" X 21" DUSTLESS BELT SANDER	169
DW431	3" X 21" DSTLS BELT SANDER VAR SP	188
DW610	1 1/2 HP ROUTER, 9 AMP	149
DW615	1 1/4 HP PLUNGE ROUTER, VAR SP	164
DW625	3 HP HVY DTY PLUNGE RTR, VAR SP	279
DW670	*NEW* LAMINATE TRIMMER WITH GUIDE	97
DW682K	BISCUIT JOINER KIT	224
DW930	12V CORDLESS CIRCULAR SAW	109
DW930K	12V CRDLS CIRC SAW KIT W/BAT & CS	199
DW935	14.4V TRIM SAW	149
DW935K	14.4V TRIM SW KIT W/BAT, CHRGR, CS	249
DW972K2	*NEW* 12V CRDLS KIT/W BATTERY & CASE	189
DW991K	14.4V CRDLS KIT W/BATTERY & CASE	199

Milwaukee

0407-1	12V KYLS CDLS DRILL KIT W/2 BAT, CS	179
6490	10" MITER SAW	264
6494	10" COMPND MITERSAW W/CARB BLD	322
6507	VAR SPEED SAWZALL W/BLADES & CSE	145
6511	SAWZALL 2 SPEED WITH CASE	139
6527	SUPER SAWZALL W/BLADES & CASE	176

SENCO

SLP20	BRAD NAILER W/CASE 5/8"-1 5/8" CAP	268
SFN40	FINISH NAILER 1 1/4"-2 1/2" CAP	379
SKS	NARROW CROWN STAPLER 5/8"-1 1/2"	268
SLS20	1/4" CRWN STAPLER, 3/8"-1 1/2" OILESS W/CS	248

RYOBI

DC500	DETAIL CARVER	62
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TR215	8 1/2" SLIDE COMPOUND MITER SAW	369
JS100	BISCUIT JOINER	164
JS102	BISC JOINER W/TILT FENCE & DUSTBG	189
FT2000E	3 1/4 hp ROUTER VAR SPD	205
EB100	EDGE BANDING SYSTEM	208
EDS132	13.2V CRDLS DRILL KIT W/2 BAT	215
FB107	7 PIECE FORSTNER BIT SET	57
FC107	7 PC CARBIDE FORSTNER BIT SET	84
LM72M010	10" X 24T FLAT TOP RIP BLADE	36
LU82M010	10"X 60T CROSSCUT/RIP BLADE	49
LU84M010	10" X 50T ATB COMBO BLADE	40
LU85M010	10" X 80 T ATB FOR MIRROR FINISH	58
LU87M010	10" X 24T RIP BLADE THIN KERF	39
LU88M010	10" X 60T CROSSCUT THIN KERF	45
LU89M010	10" X 72T TCH NON FERROUS METAL	57
LU92M010	10" X 80T TCH - BEST FOR LAMINATES	59
LU98M010	10" X 80 T TCH LAMINATES OR WOOD	67
SD308	8" SAFETY DADO WITH CASE	116
SD508	*NEW 8" SUPER DADO SET*	168
WC104	4 PIECE WOOD CHISEL SET	46
WC110	10 PIECE WOOD CHISEL SET	86
94-100	CABINET DOOR SET	158

SHOP TESTED

PRODUCTS THAT PERFORM

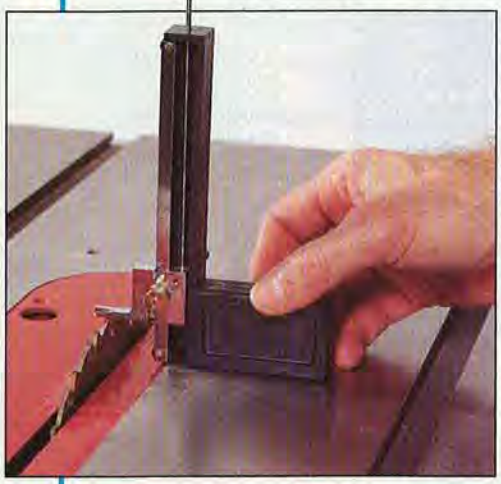
Measuring gauge provides accuracy

Measuring the height of a blade or router bit with a try square won't cost you anything, but then again it won't give you much precision, either. Leichtung developed this new Height/Depth Gauge to give you the ability to accurately read a number of different measurements around the workshop.

The 5" gauge measures to the top of a router bit or tablesaw blade, or to the bottom of a radial-arm saw blade. A magnetic base on the gauge allows you to place it securely on a cast-iron table and have both hands free. And a sliding rod enables you to check the depth of grooves or holes.

In my tests, I found the gauge easy to adjust, and the height and depth readings proved more accurate than you'll ever need in woodworking. The 1/32" intervals and millimeter markings on the photo-engraved stainless-steel rule are easy to see. This is a useful tool at a good price. I'd recommend it to anyone who needs close tolerances and precise machine setups in their routing and sawing operations.

—Tested by Bob McFarlin



Height/Depth Gauge, $17.49 ppd., Leichtung Workshops, 23297 Commerce Park, Beachwood, OH 44122-5808. Call 800/321-6840.

Detail carver scores a hit with pros and novices

Just before I took the new Ryobi Detail Carver to my monthly carver's club meeting, I called the local supplier to see how many he had in stock. When he told me just six, I suggested that he order six more since twelve members attend the meetings. Sure enough, after my demonstration, everyone rushed out to buy one.

The Ryobi Detail Carver has a 110-volt DC motor that causes the blade to reciprocate at two speeds: 10,400 or 12,500 strokes per minute. This high-speed chiseling action does most of the work so you never have to force the blade. And, since the reciprocating motion is pressure-activated, you're less likely to gouge the wood if you slip.

For experienced carvers, the biggest advantage this tool offers is that it removes a lot of material quickly. For those of you who limit your carving because of arthritis, bursitis, or carpal-tunnel syndrome, the Ryobi represents a major breakthrough. With its comfortable two-handed grip, you can carve extensively without exerting anything more than light pressure. I also think novice carvers will get a lot of satisfaction with the Ryobi. They can get impressive results fast and spend less money than they would for a basic set of carving tools.

The Ryobi comes with five blades: a 6mm 90° V, 9mm #9 gouge, 9mm bullnose, 9mm straight chisel, and a 4mm straight chisel. On the bottom of the V-tool, the profile returns to a flat shape behind the grind. I'd prefer that the bottom retain a crisp V-profile to make it easier to follow the cut and prevent the blade from rising out of the cut. I also would grind a slight curve on the corners of the 9mm #9 gouge as the pointed corners on the factory grind cause some tearing in soft wood. I also noticed that the tool gets warm after about 20 minutes of use if you cover the vent holes with your hands.

These minor points aside, the blades are forged from a good-quality steel. They come well-sharpened and require only a light stropping. Ryobi also sells an additional set of six blades: a 3mm V, 7mm V, 4mm skew chisel, 4mm deep gouge, 6mm straight chisel, and 8mm shallow gouge. The set is sold with a storage case and costs about $24.

To test the machine, I tried it on walnut, oak, butternut, basswood, and driftwood. In every case, the Ryobi delivered good results with ease and speed. I used the V-tool to carve the outlines of the eagle in the photo *above*, the gouge and bullnose to carve the relief pattern in the background, and the chisels to shape the details.

The other power carvers I've owned cost double or more the price of the Ryobi. But even if price were no object, the Ryobi still rates as the first tool I'd turn to for power carving.

—Tested by Jim Rose

Ryobi Detail Carver, about $75 in stores or catalogs. Write to Ryobi Customer Service, P.O. Box 1207, Anderson, SC 29622. Call 800/525-2579.

Continued on page 32

SUPER SUMMER only COMBO SALE

BUY 1 BLADE OR DADO AT **10%** OFF SALE PRICE, 2ND BLADE **20%** OFF
(EQUAL OR LESSER VALUE) **15%** OFF DADO AS SECOND CHOICE. Expires 8/31/95

FREE - $45 IN SHARPENING COUPONS WITH EACH BLADE OR DADO SET

$74 net cost to you (after using $45.00 in sharpening coupons at right) on purchase of our BEST SELLER 10" 40T today on SALE at $119. Receive with every FORREST Blade or Dado listed, nine-$5 sharpening coupons!!

Outperformed 36 other premium blades, both foreign and domestic!!

Wood Magazine test, Sept., '93, pg. 45.

The One Blade That Leaves A Smooth-As-Sanded Surface!!!

Dear Mr. Forrest:
What a pleasure it is to find a product that is even better than expected. I am a long time owner of a Woodworker I (10"-60T) which I use with your 4" stabilizer. It has consistently produced cross cuts on my radial arm saw which look polished and are far superior than any produced using any other blade I have tried, but it is not good for ripping. When I recently purchased a new Delta 10" Contactor's Saw, I tried it with a couple of premium blades, including a specialized rip blade, as my principal use was ripping 1" oak planks. Although everything checked out, and the blade was sharp, I was not satisfied.

Fortunately, I ran into one of your magazine ads and, despite the price, I purchased a new Woodworker II (10"x1/8"-40T) with a 5" stabilizer. The first thing I did when I opened the package was to nick my finger on one of the teeth. *I have never seen a saw blade so sharp!* I immedialely had to test the new blade, now wearing gloves for the installation (doesn't take me long to look at a horseshoe).

The first cut was ripping a three foot piece of 1" thick oak. *I thought that I had mis-set the fence and missed the wood.* It was so quiet that I neither heard the cut over the machine noise, nor felt the resistance as I fed the piece into the blade at normal speed. The cut edge was flawless and could have been edge-glued without jointing. I then tried a cross cut on the same piece. It was every bit as smooth as the rip and every bit as quiet and effortless. I have since learned to hear the whisper of the cutting and to feel the almost sensual touch of the blade slicing through the wood. In over 40 years of making sawdust, I have never worked with so fine a blade. I have heard all my life that no combination blade could equal both dedicated rip and cross cut blades, but the WW II proves that to be an "old saw," (pun intended).

As soon as I realized what a teriffic tool my new WW II was, I immediately sent you the old WW I and the rip blade for re-sharpening. I have been using it for about six years, so maybe it has worn a bit.

Sincerely, Hank Meltzer Richardson, Texas

GOOD ON ALL FORREST OR OTHER MAKES OF CARBIDE BLADES OR DADO SETS. Total Savings $82 or more! Nine $5 sharpening coupons supplied with blade or dado. Offer good through August 31, 1995.
Must mention WOOD® mag. to receive coupons and extra bonus.

WOODWORKER II	List	SALE
14" x 40T x 1"	~~$215~~	$149
14" x 30T x 1"	~~195~~	139
12" x 40T x 1"	~~183~~	129
12" x 30T x 1"	~~162~~	119
10" x 40T x 1/8" or 3/32"	~~156~~	119
30T 1/8" or 3/32"	~~135~~	99
9" x 40T	~~146~~	109
30T	~~125~~	99
*8-1/4" x 40T 3/32"	~~136~~	99
8" x 40T 3/32"	~~136~~	99
30T 3/32"	~~115~~	89
7-1/4" x 30T 3/32"	~~112~~	69
**NEW 6" x 40T 3/32"	~~136~~	89

***NEW For Sears & Makita Table Saws **For Saw Boss**

FORREST,
WELL - I WILL BE D_ _ _ _ - READ YOUR STATEMENTS ABOUT YOUR BLADES AND ORDERED ONE EACH, WOODWORKER I & II. YOUR BLADES ARE AS ADVERTISED - WHICH IS A PLEASANT CHANGE IN TODAY'S WORLD, SINCE SO MANY CO'S ARE GOING OUT OF BUSINESS THESE DAYS - WILL PLACE THE FOLLOWING ORDER. DO NOT WANT TO BE WITHOUT YOUR BLADES, EVEN THOUGH I AM 71 YEARS OLD. (ORDERED 4 MORE BLADES & 1 STIFFENER).

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New specs • 5° Neg. Pts. & a flat, runout less than .002" for perfect, tight, smooth, splinter-free miter joints.
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Sears 8-1/4" & Delta	8-1/4" x 60T x 5/8"	170	99
Hitachi 8-1/2" DeWalt 8-1/2" & Ryobi	8-1/2" x 60T x 5/8"	179	109
Delta	9" x 80T x 5/8"	204	119
Ryobi-Makita & all	10" x 80T x 5/8"	207	129
DeWalt, Makita, B&D & Hitachi	12" x 80T x 1"	229	139
Ryobi-Makita	14" x 100T x 1"	266	179
Hitachi	15" x 100T x 1"	277	189

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Use small stiffener where possible

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this trim and crosscut ALL PURPOSE blade gives scratch free POLISHED cuts on all materials RIP or CROSSCUT up to 2".
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14" x 60T x 1" 1/8"	$224	$159
12" x 60T x 1" or 5/8" 1/8" K	198	139
10" x 60T x 5/8" 3/32" K	162	129
9" x 60T x 5/8" 3/32" K	156	119
8" x 60T x 5/8" 3/32" K	150	109
New 8-1/4" x 60T x 5/8" 3/32" K	150	109
New 7-1/4" x 60T x 5/8" 3/32" K	150	109

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OUT PERFORMS 29 + 32 OTHER DADO SETS WOOD Mag., Oct. 91, pg. 62,63 "Best Value"

"No tearout on all five woods tested." -*Fine Woodworking July/Aug, 1991*

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DURALINE Hi-AT For TABLE & RADIAL SAW

(very good on chop saw too!) STOP SPLINTERING those SPLINTERY OAKS, HARDWOOD VENEERS and *thin* 2 SIDE LAMINATES ON PARTICLE BOARD.
FOR FASTER FEED RATES AND MORE ABSOLUTE SPLINTER CONTROL.

DURALINE Hi-AT

Note: *Fine Woodworking Editorial Nov./Dec. 1988 No. 73, pg. 65, S.N. recommends high alternating top bevel (ATB) thin kerfs and large blade stiffeners for smoothest cuts on RADIAL SAW, etc.*

Jim Forrest, President and designer microscoping cutting edge.

All 5/8" holes. Boring up to 1-1/4" $7.50 extra
Larger holes - time basis. Shipping $4.50

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9" x 80T 1/8" & 3/32"	207	$179
10" x 80T 1/8" & 3/32"	207	$159
SPECIAL SALE10" ONLY $159		
12" x 80T x 1" 1/8"	212	$181
12" x 100T x 1" 1/8"	253	$215
14" x 80T x 1"	232	$197
14" x 100T x 1"	266	$226
16" x 80T x 1"	262	$223
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PRODUCTS THAT PERFORM

SHOP TESTED

Continued from page 30

A terrific belt for shop vacuums

Not too long ago, manufacturers started building accessory storage into shop vacuums. But there must be hundreds of thousands of the earlier models with no storage capability at all. The Handy Vacuum Pac solves that problem as fast as you can strap it onto your shop vacuum.

This 2"-wide nylon belt fits vacuums from 32" to 48" in circumference, which covers most of the basic shop-vacuum sizes. You can store up to seven accessories in the loops on the belt including 2½" and 1¼" wands. The belt and buckle are well made and should hold up for the life of the vacuum. Even if you have some storage on your shop vacuum, you may find the Handy Vacuum Pac useful in that it increases the number of accessories you can store on your shop vacuum.

—Tested by Bob McFarlin

Handy Vacuum Pac, $14.20 ppd. Robert James Enterprises, Inc., Route 2, Box 1990, Niangua, MO 65713. Call 417/468-4600.

Continued on page 34

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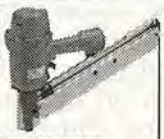

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The angled magazine stays clear of your work surface for maximum visibility and toe nailing. Allows fast loading of up to 3 sticks of nails (75 or 105 nails per stick).
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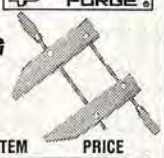

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12"	8-1/8"	04854-0VBA	$8.99

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20 PC. TiN COATED FORSTNER BIT SETS
Professional TiN coated bits always outlast standard steels! Includes 3/8" cut down shanks and individually organized wooden case. Rockwell hardness range from 55-65 HRC. 20 Sizes from 1/4" to 2"

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10" 2-1/2HP TABLE SAW
- Max. depth of cut @ 90°: 3"; @ 45°: 2-1/2"
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- Blade sold separately

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- 40 Tooth Carbide Tips

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This unit has the features you need: safety trigger, adjustable nailing depth, see-through magazine, and easy jam clearance. Slides are high impact plastic. Tool weight: 2 lbs.
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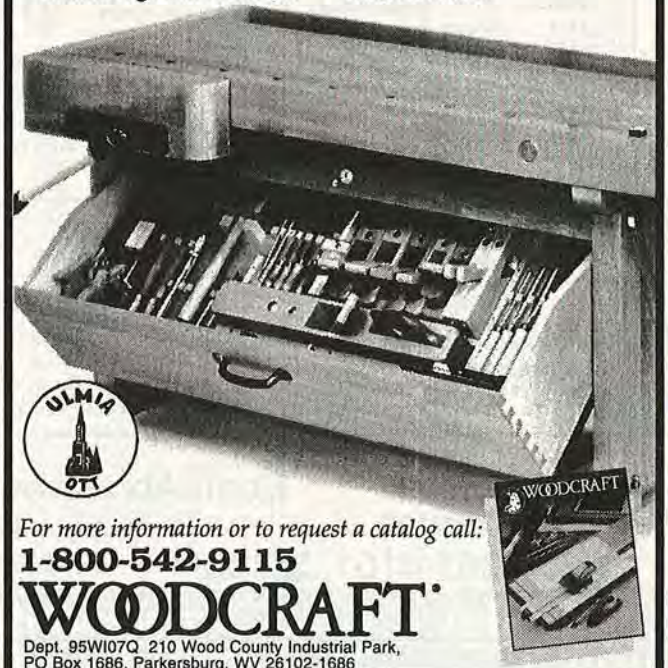

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SHOP TESTED

Continued from page 32

In-line jigsaw cuts curves in tight corners

If you crossed a jigsaw with a reciprocating saw, the offspring would look like the new Bosch Sabre-plus In-line Jigsaw. Mechanically, the Sabre-plus operates just like a jigsaw. The blade cuts at variable speeds ranging from 300 to 3,800 strokes per minute. To cut aggressively you can put the saw on one of three orbital-stroke settings.

For basic cutting, you simply use a long bayonet-style jigsaw blade. But what really expands the range of this tool are the accessories. These include a rasp with both flat and round edges, and two types of brushes—steel and nylon bristle. If you like power carving, the rasp hogs away wood fast. And the brushes do a great job of stripping finishes and cleaning hard-to-reach areas. With the Bosch "Clic" system, you can change blades and accessories in just seconds without tools.

To start the saw, you squeeze the paddle switch on the barrel and pull backward. This seems awkward at first. But it's comfortable once you get the hang of it, and it helps prevent accidental starts. While cutting, I found I could turn the saw 180° within a 4" space and cut 2"-diameter holes. That beats the cutting radius of even the smallest reciprocating saw.

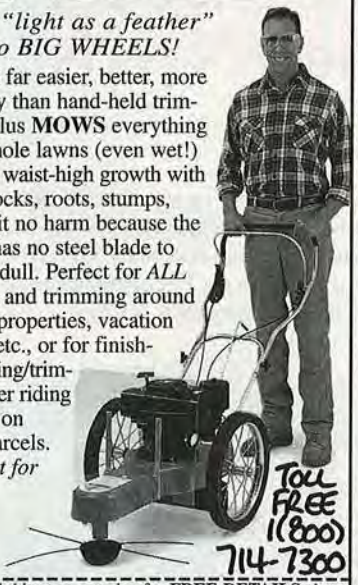
The foot plate that comes with the saw can be adjusted in or out 1". This allows you to control the depth of your cut or use a different area of the blade as the teeth become dull. An optional angled foot plate enables you to make 45° beveled cuts. This tool won't replace your jigsaw, but it works great for making cut-outs in any tight spot. With a ⅝" stroke the Sabre-plus has enough muscle to serve as a light-duty reciprocating saw, and the accessories give the Sabre-plus capabilities no other tool offers.

—Tested by Dave Henderson

Bosch Sabre-plus In-line Jigsaw, about $130. S-B Power Tool Company, 4300 West Peterson Ave., Chicago, IL 60646-5999. Call 312/286-7330.

New TRIMMER ON WHEELS!

Rolls "light as a feather" on two BIG WHEELS!



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Note: * = thru 320 grit * Now in 5 hole pattern *

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JUMBO ROUTER PAD(24" x 36")
It will not allow small blocks of wood to slip out under router or sanding applications. ROUTER PAD ONLY $8.95ea.

Lint-Free Wiping Cloths
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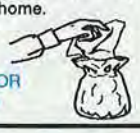

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2708W	8 1/2" Table Saw	297
3612BRA	Plunge Router	173
4301BV	Jig Saw	157
5007NBK	7-1/4" Circ. Saw	127
5090DW	3-3/8" Cordl's Saw	137
5090D	tool only	80
5402A	16" Beam Saw	529

6095DWE	9v. Cordless-2batt.	137
6405	3/8" Drill	53
9820-2	Sharpener	204
9901	3 X 21 Belt Sander	129
9924DB	3 X 24 Belt Sander	183
BO4510	Square Pad Sander	49
BO5000	Random Orbit Sander	68
JR3000V	Recip-Saw	134
LS1030	10" Miter Saw	195
LS1020	10" Miter Saw	228
N1900B	3" Planer Kit	129
N9501B	Mini Grinder Kit	98

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2621	3/8" Keyless Drill	88
310	Laminate Trimmer	144
312	Offset Trim Router	157
332	RO Sander	65
347	7" Circular Saw	126
743	Left hand saw	127

361	3X24 Belt Sander	181
363	4X24 Belt Sander	190
410	Betterly™ Underscribe	147
411	Betterly™ MiterFold	164
447	7-1/4" Framer Saw	133
5008	12" Dovetail Jig	77
511	Door Lock Kit	138
5116	16" Dovetail Jig	252
6611	3/8" Drill 5.5 amp	123
6614	1/2" Drill	127
6615	1/2" Keyless Drill	127
666	3/8" Drill	124

690	1-1/2 hp Router	139
693	1.5hp Plunge Router	168
6931	Plunge Base	72
695	Router Table w/motor	215
696	Router Table only	127
7116	24" Doevtail jig	292
7399	Drywall Cutout	78
743	7-1/4" Right hand Saw	127
7518	Vari Sp 3 hp Router	266
7519	3 hp Router	232
7536	2 hp Router	201

345 6" Saw Boss $103

7537	2 hp D-Handle Router	207
7538	3 hp Plunge Router	234
7539	VS Plunge Router	268

7549	Jig Saw	133
7800	Drywall sander	328
7810	Vacuum	252
9118	3 1/4" Planer Kit	204
9314	Trim Saw Kit	151
9345	Sawboss w/ case	123
9690	1.5 hp Router w/case	144
96645	Screwgun w/ case	128
97310	Trimmer Kit	193
973366	RO Sander w/case	136
9743	7-1/4" Saw Kit	139

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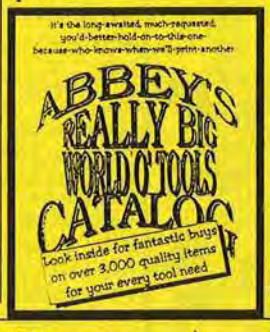
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0228-1	3/8" 0-1000rpm Drill	108
0229-1	3/8" Keyless Drill	108
0234-1	1/2" Magnum Drill	128
0236-1	1/2" Magnum Kit	148
0238-1	1/2" 0-850rpm Drill	128
0239-1	1/2" Keyless Drill	128
0244-1	0-600 rpm Magnum	127

0375-1	3/8" Close Qtr Drill	128
0379-1	1/2" Close Qtr Drill	148

0407-1	Cordless Drill Kit-2batt	172
0421-1	12V Cordl's HammerDrill	189
0567-1	Drain Cleaner	234
3300-1	Rt Angle Drill	189
3107-1	VS Rt Angle Drill	213
5192	Die Grinder	174

DeWALT

DW682K Biscuit Joiner $218

DW100	3/8" Drill	67
DW106	3/8" Keyless Drill	73
DW411	Palm Sander	58

DW930K	Cordless Saw	198
DW935K	Cordless Saw	219
DW972K2	12V Cordless drill	188
DW974K	14V Cordless drill	188

DeWALT

DW705 12" Compound $358

6494 10" Compound Miter $309

5362-1	1" Hawk Hammer	328
5365-1	1" Hawk Hammer Kit	348
5369-1	3/4" D-handle Falcon Kit	238
5371-1	1/2" Hammer Drill	184
5375-1	1/2" Hammer Drill Kit	178
5392-1	3/8" Hammer Drill	126
5397-1	3/8" Hammer Drill Kit	138
5460	7" Polisher	168

5682	2 Hp Router	165
5936	4 x 24 Belt Sander	227
6008	1/3 Sheet Sander	123
6010	1/2 Sheet Sander	123
6140	4 1/2" Grinder	94
6142	4 1/2" Grinder Kit	123
6175	14" Chop Saw	278
6266	NEW!! Jig Saw	187
6365	7-1/4" Circular Saw	119
6366	6365 w/Carbide bld	128
6368	7-1/4" Saw Kit	138
6460	10" Circular Saw	268
6490	10" Miter Saw	254
6491	10" Miter Saw w/80t Bld	274
6527	VS Super Sawzall	171
6528	VS Super Sawzall	169

6539-1	Inline Screwdriver	74
6546-1	2 spd Inline Screwdriver	81
6547-1	2 spd Screwdriver Kit	108
6758-1	Drywall Screwgun	98
6767-1	Screwdriver Kit	137
8975	Heat Gun	55
8980	Heat Gun Kit	91

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3283DVSK	RO Sander Kit$	117
B4050New!	Inline Jig Saw	113
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11222EVS SDS Rot	Hammer	429

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2038	HD Screwgun	98
2660	Drywall Screwgun	86
2670	1/2" Impact Wrench	149
2721	1.5hp Router 1/2" collet	148
3105	Reciprocating Saw	148
3339	3hp VS Plunge Router	268
4075	7" Wildcat Grinder	165

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37-070 $247 6" Table Top Jointer

14-650	Hollow Morise Chiser	279
Set of 4	Mortise bits	99
22-540	12" planer	388
28-180	10" band saw	163
31-050	1" belt sander	74
31-080	1" Belt 5" Disc Sander	88
31-340	1" Belt 8" Disc Sander	203
31-460	4" Belt 6" Disc Sander	126
32-100	Plate Joiner	258
36-040	8" Compound Miter	154
36-090	Sidekick 10" Miter Saw	213
36-220	10" Compound Miter	228
40-150	15" Scroll Saw	115
40-560	16" Scroll Saw	177
40-640	20" Scroll Saw	298
35-617	10"x50T Carbide Blade	34
35-677	14"x108T Carbide Blad	75

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Ryobi	30 pc assorted	$4.25
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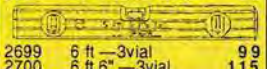

2699	6 ft —3vial	99
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2701	8 ft —3vial	125

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AP10	Replacement Blades	24.95
BS900	NEW! 9" Band Saw	168
DP80	8" Drill Press	99
DP100	10" Drill Press	119
DS1000	Detail Sander	39
J60VK	JigSaw Kit	85
TRMK2	Trimmer w/ 2 bases	99
RJ100VK	Reciprosaw	99
RS115K	RO Sander Kit	69
SC162	Scroll Saw	119
SC162VS	VS Scroll Saw	169
TS251	10" Miter Saw	169
TS254	10" Miter Saw	197
TS380	15" Miter Saw	365

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565T	1- 2-1/2" Finish Gun	204
626SK	1/4" Crown 1" StaplerKit	104
8290	6d-16dFrming Nailer	314

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TR215	8"Compound Miter Saw	349
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LU84M011	10" 50T Combo	40
LM72M010	10" 24T Rip	36
LU85M015	15" 108T Finish	99
LU82M010	10" 60T Chipboard	45
LU89M010	10" 72T Aluminium	57
LU92M010	10" 60T Corian®	55
LU98M010	10" 80T Laminates	67
LU73M010	10" 60T Crosscut	45

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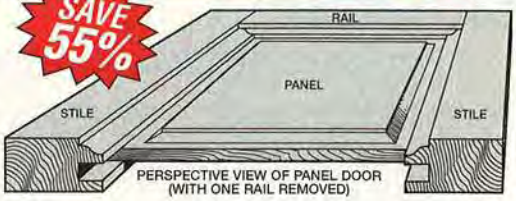

PERSPECTIVE VIEW OF PANEL DOOR (WITH ONE RAIL REMOVED)

Professional production quality bit makes it quick and easy to produce matching rails and stiles - the panel raising bit with ball bearing guide makes the raised panel perfect every time!

SIZE & FORM	ITEM #	PRICE/SET
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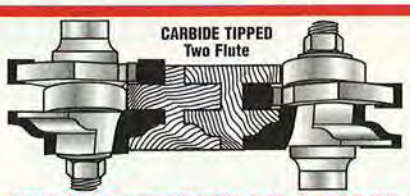

•REVERSIBLE COMBINATION RAIL & STILE BIT
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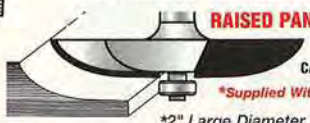

*2" Large Diameter (1/4" Shank)
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#1315	ROUND OVER - 3/16" Radius	1/4"	$11.00
#1394	ROUND OVER - 1/4" Radius	1/4"	$14.00
#1316	ROUND OVER - 5/16" Radius	1/4"	$14.00
#1369	ROUND OVER - 3/8" Radius	1/4"	$15.00
#1370	ROUND OVER - 1/2" Radius	1/4"	$17.00
#1395	ROUND OVER - 1/4" Radius	1/2"	$15.00
#1318	ROUND OVER - 3/8" Radius	1/2"	$15.50
#1319	ROUND OVER - 1/2" Radius	1/2"	$17.00
#1320	ROUND OVER - 3/4" Radius	1/2"	$21.00
#1333	TONGUE & GROOVE - Straight	1/4"	$29.00
#1334	TONGUE & GROOVE - Straight	1/2"	$29.00
#1335	TONGUE & GROOVE - Wedge	1/4"	$29.00
#1336	TONGUE & GROOVE - Wedge	1/2"	$29.00
#1337	FLUSH TRIM -3/8" Diameter -1" Cutting Length	1/4"	$ 7.50
#1338	FLUSH TRIM -1/2" Diameter -1" Cutting Length	1/4"	$ 8.00
#1400	FLUSH TRIM -1/2" Diameter -1-3/16" Cutting Length	1/2"	$ 9.00
#1340	PATTERN / FLUSH TRIM -1/2" Diameter	1/4"	$15.00
#1341	PATTERN / FLUSH TRIM -3/4" Diameter	1/4"	$17.00
#1342	PATTERN / FLUSH TRIM -3/4" Diameter	1/2"	$19.00
#1351	LOCKMITRE -7/8" Cutting Length	1/4"	$32.00
#1352	LOCKMITRE -1-1/8" Cutting Length	1/2"	$45.00
#1353	OGEE RAISED PANEL -2" Large Diameter	1/4"	$28.00
#1354	OGEE RAISED PANEL -2-3/4" Large Diameter	1/2"	$32.95
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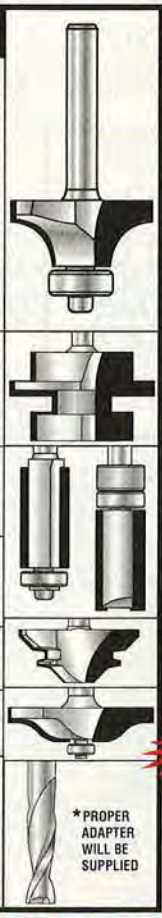
#1393	SPIRAL UPCUT - 1/2" Diameter (solid carbide)	1/2"	$33.00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#1363	1-5/8" C.L.	1/2"	$29.95
#1364	1-5/8" C.L.	1/2"	$31.95
#1365	1" C.L.	1/4"	$31.95
#1366	1-11/16" C.L.	1/2"	$31.95
#1330	BULL NOSE - 1/2" Diameter of Circle	1/4"	$16.00
#1331	BULL NOSE - 3/4" Diameter of Circle	1/4"	$21.00
#1332	BULL NOSE - 3/4" Diameter of Circle	1/2"	$21.00
#1371	STRAIGHT - 1/4" Diameter	1/4"	$ 6.50
#1372	STRAIGHT - 3/8" Diameter	1/4"	$ 6.50
#1373	STRAIGHT - 1/2" Diameter	1/4"	$ 7.00
#1374	STRAIGHT - 3/4" Diameter	1/4"	$ 9.50
#1375	STRAIGHT - 3/8" Diameter	1/2"	$ 7.50
#1396	STRAIGHT - 1/2" Diameter	1/2"	$10.00
#1377	STRAIGHT - 3/4" Diameter	1/2"	$10.00
#1397	COVE - 1/4" Radius	1/4"	$13.00
#1398	COVE - 3/8" Radius	1/4"	$14.00
#1399	COVE - 1/2" Radius	1/4"	$15.00
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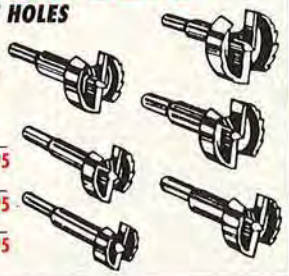

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Prized for its beauty, harvested for its durability

In the high tropical forests of Central and South America, well-drained soils furnish nutrients for a variety of dense, durable hardwoods sought for maritime use, heavy construction, and furniture. The Spanish began harvesting in Latin American forests in the early 1500s to provide timber for boatbuilding and repair. By the early 1900s, however, steel ships had replaced wooden ones, and the interest in tropical forests by both Europeans and Americans shifted to appearance-grade woods for furniture.

Although history fails to provide us with a shopping list of species from either harvest period, it's probable that the wood we know today as goncalo alves has always been sought. That's because goncalo alves, considered one of the most beautiful of tropical woods, has a tough reputation, too. Strong and durable, it's used for construction in its homeland and secondarily for fine furniture. Woodworkers elsewhere treasure the wood for decorative items and veneer accents.

Wood identification

Goncalo alves (*Astronium fraxinifolium* and *A. graveolens*), sometimes called kingwood or tigerwood, grows from southern Mexico through Central America and into South America. A common, medium-sized tree, goncalo alves attains a diameter of 24–40" and a height of 120'. Its cylindrical trunk can be clear of branches for two-thirds of its height.

Goncalo alves belongs to a large family of trees (*Anacardiaceae*) that claims over 600 species. Its relatives include the tropical cashew, pistachio, and the mango. A cousin, the smoke tree, often ornaments North American lawns, and except for its smaller size, bears much resemblance to its Latin American relation.

The grayish-white sapwood of goncalo alves gives little notice of the color that lies underneath. In shades of brown and reddish-brown—frequently with dark, nearly black longitudinal stripes—the heartwood can be stunning, especially with *Astronium fraxinifolium*. Even in its plainer forms, goncalo alves has a soft luster. With age, the color deepens to a mahogany-like, dark-red hue.

A dense wood with a specific gravity that can approach .95 (double that of hard maple),

goncalo alves also has a texture that varies from fine to medium and a grain that varies from straight to interlocked and wavy. The wood weighs about 60 pounds per cubic foot air dry and rates as highly resistant to moisture, rot, and insect attack.

Uses in woodworking

Goncalo alves esteem with North American and European craftsmen. It's made into high-value items such as archery bows, billiard-cue butts, jewelry boxes, and turnings. In veneer form, it becomes panels and decorative accents on fine furniture.

Availability

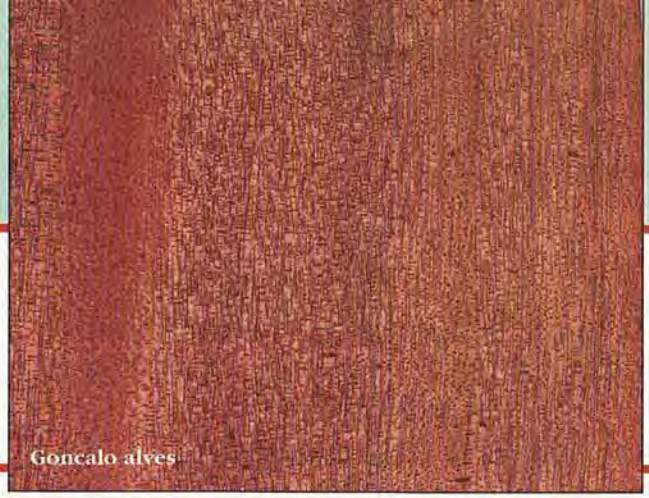
Although not readily available as lumber, goncalo alves is handled by mail-order, specialty-wood dealers. In 1" thickness it costs about $9 per board foot. As veneer for marquetry, expect to pay about $1.25 per square foot.

Continued

PERFORMANCE PROFILE

goncalo alves

(Astronium fraxinifolium, A. graveolens)



Goncalo alves

Machining methods

Both species of goncalo alves, because they are hard, heavy, and dense, require power tools for successful working. The wood takes a toll on cutting edges, too, so use carbide-tipped blades and cutters. *Then, remember these helpful tips:*

- Feed this dense wood slowly into the planer. If you find that your stock has interlocked grain, feed it at a slight angle of about 15°. If any tearout occurs, take a shallower cut.
- Goncalo alves' density also means that you should rip it with a rip-profile blade that has no more than 28 teeth. This allows sawdust to clear and avoids burning from heat buildup.
- Crosscut wood with lots of figure with the help of a backing board to prevent tearout.
- In jointing, take shallow passes of 1/32" to reduce tearout.
- At the drill press, a slower rpm (about 250) won't burn this hard wood. In deep drilling, back the bit out once in awhile to clear it.
- You'll get the best results in routing goncalo alves if you use bits with ballbearing pilots. Combine this with a consistent feed rate and you'll avoid burning.
- Due to the extreme hardness of this wood, you won't want to skip any grits in sanding or you'll leave scratches. Also avoid cross-grain sanding. You'll find that a cabinet scraper may give better results than sanding.
- Be sure to lubricate screws.
- In gluing goncalo alves, first wipe the wood in the joints with a solvent to clear natural extractives. Then, because its density resists glue absorption, use an adhesive with a longer open time, such as woodworker's white glue. Put on a light coat, briefly join the pieces, then pull them apart and let the glue set up a bit before reassembling the wood.
- Although goncalo alves takes a high luster from simple polishing, you'll want to give it a clear finish to show off its beauty.

Carving comments

Goncalo alves is hard and dense, so nothing but power-carving tools with carbide-tipped burrs will do. Start with medium-cut burrs and progress to fine ones. Coarse burrs can chip the wood.

Turning tips

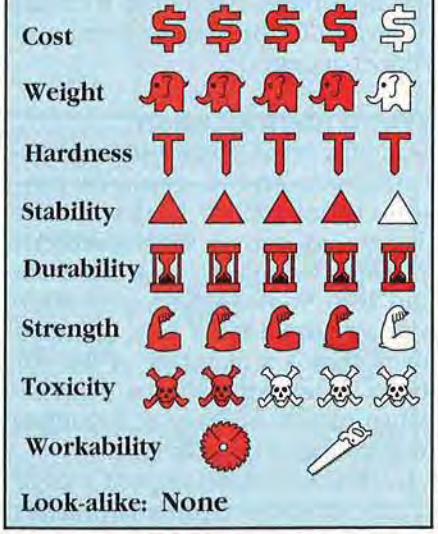
- Unless you happen to get a highly figured piece of goncalo alves with alternating grain densities, the wood turns easily as long as you have sharp tools. In the former case, be careful of tearout.
- In sanding your turning, don't skip grits or you'll get hard-to-remove scratches.

SHOP-TESTED TECHNIQUES THAT ALWAYS WORK

Any exceptions—and tips pertaining to working this issue's featured wood species—appear under other headings elsewhere on this page.

- For stability in use, always work wood with a maximum moisture content of 8 percent.
- Feed straight-grained wood into planer knives at a 90° angle. To avoid tearing, feed figured or twisted grain at a slight angle (about 15°), and take shallow cuts of about 1/32".
- For clean cuts, rip with a rip-profile blade having 24-32 teeth. Smooth cross-cutting of hardwood requires at least a 40-tooth blade.
- Avoid using twist drills. They tend to wander in the wood and cause breakout. Use brad-point bits and a backing board under the workpiece to reduce wood tearout.
- Drill pilot holes for screws.
- Rout with sharp, preferably carbide-tipped, bits. Take shallow passes to avoid burning.
- Carving hardwoods means fairly shallow gouge bevels—15° to 20°—and shallow cuts.

GONCALO ALVES AT A GLANCE



Compiled with woodworker Tom Etreses and woodturner Gary Zeff Illustrations: Steve Schindler

The Master of MUSICAL ANTIQUITY

The stringed instruments Stanley Hess builds haven't been heard from since the Renaissance.

On a trip to Italy in 1972, the direction of Stanley Hess's life changed forever. While touring the Lower Church of St. Francis of Assisi, he spotted a fresco by Simone Martini in which a street musician plays a small musical instrument called a *mandora*—a distant relative of the lute. The 500-year-old instrument impressed Stan with its elegant proportions, elaborate inlays, and superb carving. *Continued*

Stan Hess bows one of his barytons *above*. The carved eagle's head *left* graces the pegbox of a mandora—the first stringed instrument he built.

Print this article

MUSICAL ANTIQUITY

As a professor of art, and an amateur woodworker, Stan knew craftsmanship when he saw it. It bothered him, though, that his appreciation for woodworking exceeded his ability to produce it. "When I was 14, I tried to build a violin. It was a terrible mess," confesses Stan. "So I gave up on woodworking almost entirely."

But the mandora in the fresco rekindled that youthful dream. When he returned home to Des Moines, Iowa, Stan plowed deep into the library stacks at Drake University where he taught. There he found the *Syntagma musicum*, a four-hundred year-old reference book that illustrates the sizes and construction details of practically every instrument made in the Western World.

Stan combined the information in this ancient text with books by more modern musicologists, and his knowledge of design and proportion to re-create an instrment that had been lost to history.

Instruments from left to right: baryton, bass viol, and tenor viol,

With his basic woodworking skills and a lot of research, Stan was able to construct the body of the instrument. Then, he taught himself carving techniques so he could grace the instrument with the elaborate detailing he had seen in the fresco.

No two instruments alike

Since that first mandora, Stan has built some two-dozen stringed instruments, an equal number of recorders, and a handful of dulcimers. He retired and he and his wife moved to Tulsa, Oklahoma, in 1985, but time has not slowed his output or enthusiasm. At 71 he is energetic, and full of ideas.

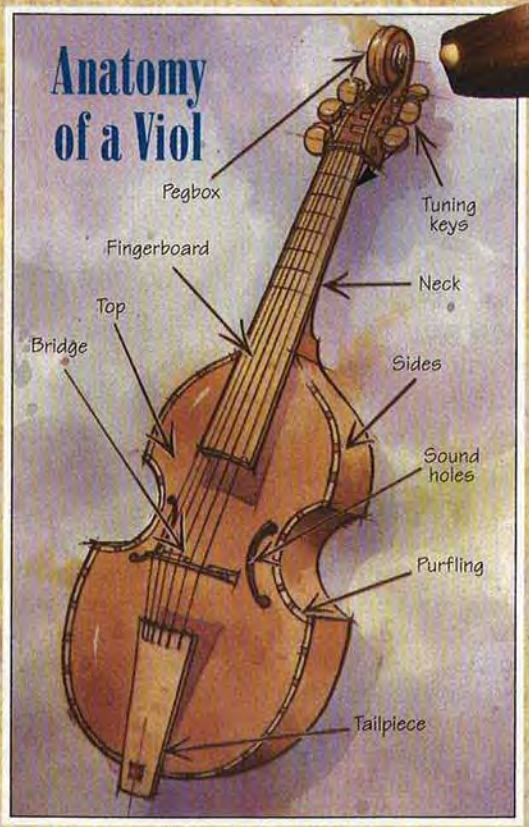
"I never make the same instrument twice," says Stan, in a low-key voice that carries just a trace of an Oklahoma drawl. "The carvings make each one unique."

But Stan's carved pegboxes, as shown in two photos *far right*, are more than unique. Each is a miniature masterpiece of sculpture, flawlessly executed. What's even more surprising than the beauty of his work is the low-tech, low-budget attitude he brings to his choice of tools. Despite a long and successful professional career, Stan never lost the down-home, make-do practicality that came from growing up in the small town of Anadarko, Oklahoma, during the depression. He still carves all his wooden pegboxes with an X-acto knife.

"It's a great tool for carving," advises Stan. "When the blade gets dull, you just throw it away." As for scrapers, Stan sees no need to go out and spend $6 for a fancy one. "I use a sharpened putty knife. It's cheap and it works wonderfully."

In search of the lost chord

After building his first mandora, Stan continued to research and build the more interesting musical instruments he found in Renaissance- and Baroque-era paintings: pocket-sized parlor violins called *pochettes*; the *cittern*, a precursor of the guitar; and the *rebec*, an ancestor of the violin family. But the stringed instruments he built were purely for show. "I never played a note on them," he says. Stan had built some recorders—the only instrument he actually played—and the difficulty of obtaining a good sound with these intrigued him. The more Stan researched acous-



tics, the more he wanted to build stringed instruments that sounded as beautiful as he could make them look.

Stan began this new quest by building a venetian-style *viol da gamba*, an instrument that resembles a small cello. Shortly afterward, he discovered an extremely rare instrument, the *baryton*, and in it he found his heart's delight. Sized and played like a bass viol, the baryton employs anywhere from nine to 22 sympathetic strings underneath the six main strings. When the main strings are bowed, the sympathetic strings respond with a deep, droning sound. To Stan, the baryton opened up a whole new world of obscurity, complexity, and elaborate detailing.

"In the 18th century, the Austrian composer Franz Joseph Haydn wrote 75 sonatas for this instrument," says Stan. "But after I built my first baryton, I came up with a theory as to why they became extinct. The composers and conductors no doubt loved the baryton's big droning sound, but it was a very complicated instrument to make. The composers probably asked the makers to keep adding strings, and I think that at a certain point the makers just gave up. Stan, however, never gave up, and has built three barytons to date. In doing so, he helped contribute to a revival of interest in the long-forgotten baryton and the music Haydn wrote for it.

A delicate balance of strength and weight

Building an acoustic stringed instrument like a viol or baryton requires the maker to balance two conflicting demands—weight and strength. "The lighter instruments typical of early makers had less mass and wood involved, and for this reason they probably had a better sound," explains Stan. "But these thin-walled instruments also must possess considerable strength. Once they are tightened to pitch, the strings on a baryton, for example, exert considerable tension." To resolve the conflict between weight and strength, makers use quarter-sawn stock throughout the body of the instrument—usually a highly-figured maple for the sides and back, and spruce for the top. *Continued*

The carving on Stan's first baryton, *left*, is a re-creation of a book plate depicting Franchino Gafori, a 16th-century musical theorist.

The idea for the carved figure on the viol pegbox, *above*, came from a 12th-century illuminated letter.

MUSICAL ANTIQUITY

Above: After soaking a baryton side, Stan heats it on a soldering iron sheathed by a copper pipe.

Below: The side is clamped to a mold and glued to blocks placed in rabbets in the mold.

Above: This homemade clamping device ensures even pressure along the curved edges.

Above: Stan roughs out the shape of a carving on the bandsaw. The neck is for a baryton.

Instruments from left to right: pochette, mandora, and cittern,

Draw first, cut later

Stan begins each instrument-building project with research and drawings. He designs the entire instrument, including the plans, elevations, cross-sections, and pegbox carving on paper first. Then he moves to the workshop and glues up several pieces of maple for the instrument neck.

The slow work of thicknessing the back and sides comes next. Starting with a surface planer, Stan brings the ¼"-thick quarter-sawn pieces down to roughly ⅛", and then gets down to business with his putty-knife/scraper. The finished backs wind up 3mm thick and the sides measure 1.5mm to 2mm thick.

Once the sides are scraped, Stan soaks them in water for about 30 minutes. Then he heats the pieces by working them back and forth over a large soldering iron sheathed with a section of copper pipe. When they become pliable, he quickly clamps the side pieces into a two-piece mold and lets them sit for about a day.

After the mold is removed from the sides, Stan glues pre-bent "linings" to the inside on the top and bottom edges. These linings are long, thin strips of wood about 2.5mm thick which serve to increase the gluing area for the top and back pieces. With the linings in place, Stan then glues on the back of the instrument using a homemade board that holds a series of closely spaced clamps, as shown in *Photo 3 above.*

Scenes from an ancient world

While the back is in clamps, Stan works on the glued-up neck blank. He cuts the basic shape on a bandsaw, drills holes along the sides for the tuning pegs, and then returns to the bandsaw to rough out the pegbox carving.

Stan's carvings fall into two categories—re-creations of scenes from Renaissance art, and original designs. On his original designs, Stan often employs a double image. "Close up, you see one figure, but move ten paces back," says Stan, "and the image changes." At arm's length, for

Below: **With violin-maker's planes, Stan carves the top of a baryton down to its final shape.**

Above: **With the lining in place, Stan test-fits the top prior to glue-up.**

Below: **Stan uses a jeweler's saw to cut purfling pieces from rosewood and ivory.**

example, his "Adam and Eve" peg-box on the baryton in the photo on *page 40* shows a man and woman seated with their knees together. Viewed from a distance, though, the details blur into the image of a serpent's head.

Fitting the neck to the body

The most critical part of the instrument-building process comes when Stan fits the finished neck to the body of the instrument. First, he routs a large dovetail into the glue block at the top of the body, and then he carves the mating pin on the base of the neck. Fitting this large dovetail requires hours of meticulous work—paring away paper-thin slices on the edges of the pin to ensure a tight fit and a perfect neck-to-body angle.

Shaping the top of the instrument also requires a masterful touch. The top starts as two book-matched pieces of quartersawn spruce, ¾"-thick, edge-joined down the middle. Then, over the course of two days, Stan patiently carves away wood using small violin-maker's planes, as shown in *Photo 5*.

The challenge in shaping the top comes from the complex shape of this critical part of the instrument. A horizontal cross section through the top of a baryton or viol would reveal a subtly arched form much like a very flat bell curve. And the thickness of this piece of spruce must vary from 4.5mm in the center to about 3mm on the edges.

"More than anything else, the top affects the way the instrument sounds," says Stan. "It's the amplifier, the part that vibrates in response to the strings." A perfectly thicknessed top will vibrate with greater clarity and volume than one less expertly shaped.

Finishing with inlays

When the top is done, Stan glues it to the sides with the same clamp board used to glue the bottom on. Next, he selects some rosewood or ebony to make the fingerboard (the part where your fingers hold the strings down), nut, tailpiece (the anchor for the strings), and tuning pegs. He also finishes the edges of the top with a decorative inlay called purfling that he cuts with a jeweler's saw and glues into a shallow rabbet.

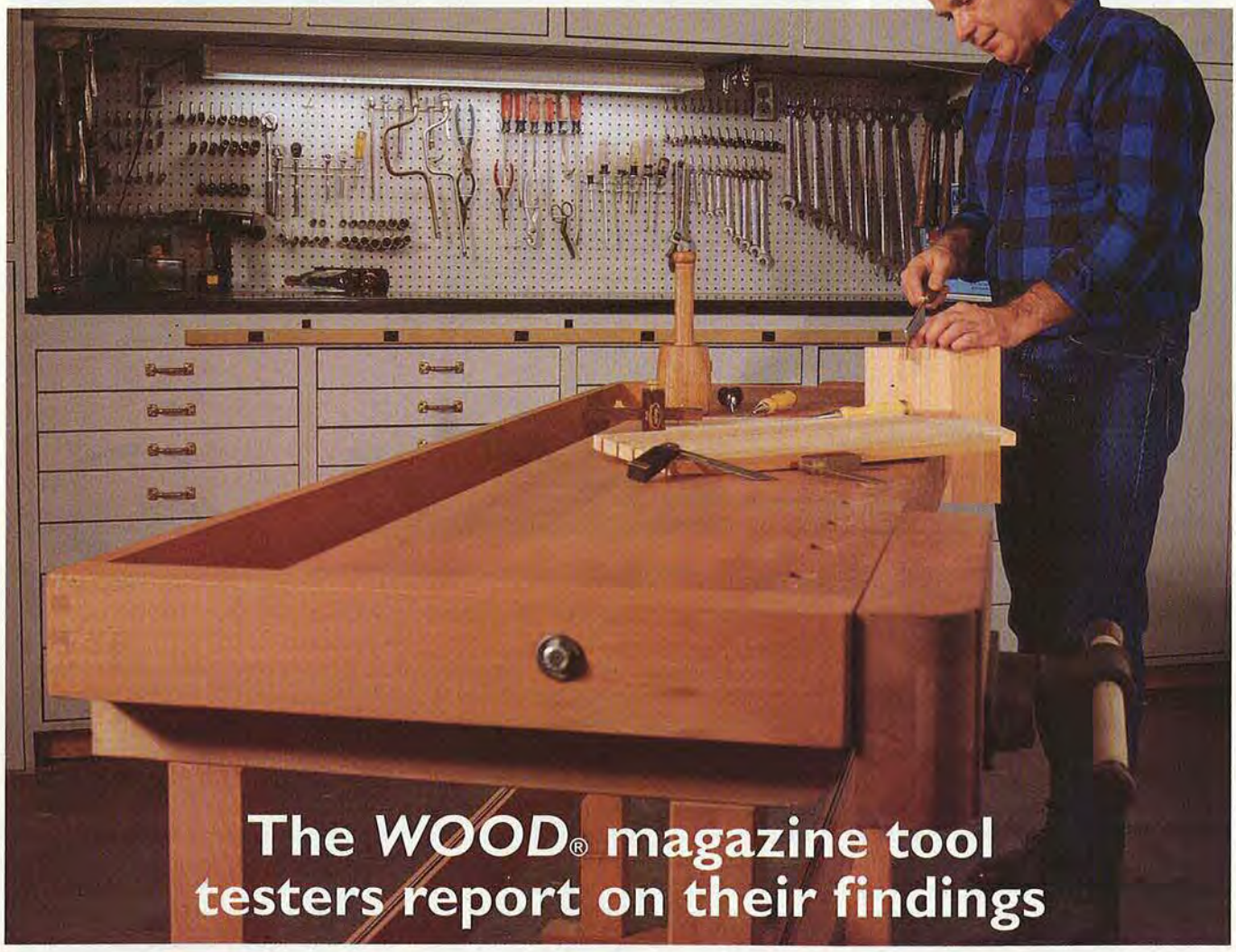
Stan then brings the inlay flush with the body by careful scraping. "I try to avoid sandpaper," says Stan. "It closes up the pores of the wood and dulls the sound." With the woodworking on the body complete, he starts in on the finish. Depending on the instrument, Stan may apply a stain followed by a filler and then six or more coats of a violin varnish. After the finish dries, he attaches the tailpiece, fingerboard, frets, and finally the tuning pegs.

Stringing and playing the instrument is every maker's moment of truth. "There are so many variables and so many subtle influences on the sound of an instrument that you'll never know if you have a dud or not until you play it," says Stan.

And if the instrument doesn't sound right? "You take off the top, alter the thickness or reshape the curves, put it back together, and hope for the best."

Written by Tom Jackson Photographs: Bob Hawks

WOODWORKING



The *WOOD*® magazine tool testers report on their findings

If you're like a lot of woodworkers we know, you've probably admired the finely crafted workbenches available through woodworking catalogs, and dreamed of either buying one or building such a bench yourself. So have we. To learn more about these benches, we gathered together as many models as we could find on today's market and gave them a thorough tryout. Here's what we discovered.

Why you need a good workbench

For most of us, a workbench ranks as the most-utilized, yet least-appreciated, "tool" in our shop. Although we rarely stop to think about our benches (perhaps because they don't require regular maintenance), they serve as the focal point of our woodworking activity. It's here that we study shop drawings, work with hand and portable power tools, even set a cup of coffee.

For most of these activities, we need a bench with a solid top and well-designed vises. When you're ready to assemble a project, for instance, a good bench comes through by providing a true and level surface. (You know the importance of a flat top all too well if you've ever tried to assemble a square frame, a flat tabletop, or a four-legged project on a warped benchtop.)

Note: *If you own a bench with a warped top, see what you can do to fix it in the article on* page 10.

So why not make your own?

Right now you may be wondering why you should shell out the big

Print this article

BENCHES FROM $170 TO $1,350

bucks (upwards of $1,000 for the best models) for a manufactured bench when you can make one yourself. We asked ourselves this very question, and came to the following conclusions.

Even though manufactured benches may seem expensive, don't expect to save a lot of money by building your own. For example, consider how much it would cost you to build a bench comparable to the top bench in this article—the Ulmia Master Cabinetmaker's Bench.

The Ulmia model costs $1,350 plus shipping from West Virginia. By our estimate you would spend about $950 for the wood, hardware, and other materials to build a similar version. And, Chuck Hedlund, *WOOD®* magazine's project builder, estimates it would take him about 40 hours to build a bench of this quality. So, assuming a shipping cost of $100 for the Ulmia bench, Chuck calculates that his savings for making the bench would amount to about $12.50 per hour of time required. Keep in mind that Chuck is a professional woodworker with years of experience.

Of course, our calculations do not take into account the pride you will earn from making such a project yourself. But, since you will have a considerable amount of wood invested in a large-sized bench, carefully consider if you have the necessary skills and equipment before tackling such a project. Then, try to obtain existing plans (Woodcraft Supply sells plans and parts for two styles of Ulmia benches for $9.95 each. Call 800/535-4482.)

How much bench do you need, anyway?

The benches in our test range in weight from 50 to 310 pounds, and require from 30 to 66 square feet of floor space (allowing for 3' of standing room in front of the vises). Available work surface (not counting tool trays) varies from 13½×29½" to 24¼×78¾". Here's how to determine what workbench size best suits your needs:

•First, determine where you will place the workbench in your shop, and how much space you can devote to it. Remember that while you need standing room on at least two sides of any bench, it's best if you can freely move completely around it.

•If you do much handtool work such as planing, chiseling, or sawing, you need a large, stout workbench. Don't even consider the models weighing less than 150 pounds unless you secure them to the floor or weight them down. Even then, narrow your choices to the benches that receive only "good" or "better" ratings for vise performance and durability in the chart on *page 48*.

•Consider, too, the size of your typical projects. If you stick to carving or building small items such as toys or jewelry boxes, you don't need a humongous bench. If you lean toward cabinet and furniture projects, you need a bench with a big top, unless you have another large, flat surface that you can use for assembly.

•Finally, take into account your own height. The tested benches range from 33¼ to 35¾" tall. That may not seem like much of a difference, but the six-footers on our staff found the taller benches considerably more comfortable.

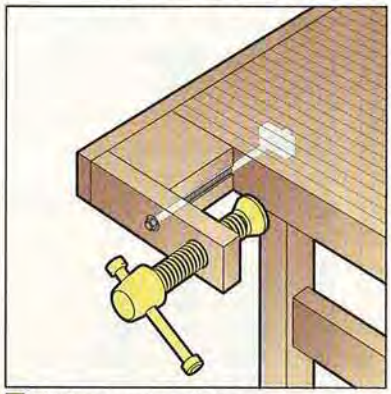
A workbench is only as good as its vises

Many of the tasks that you perform at a bench require a vise. So, you'll appreciate one that's sturdy and designed to firmly hold your workpieces. The benches in this article each have two vises from among the types shown *below*. Here's what you need to know about them.

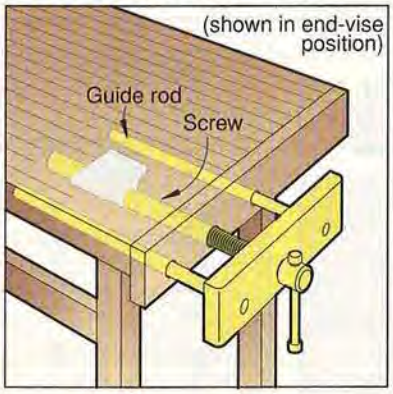
Most of the benches on today's market have an ***end*** and a ***face***

Continued

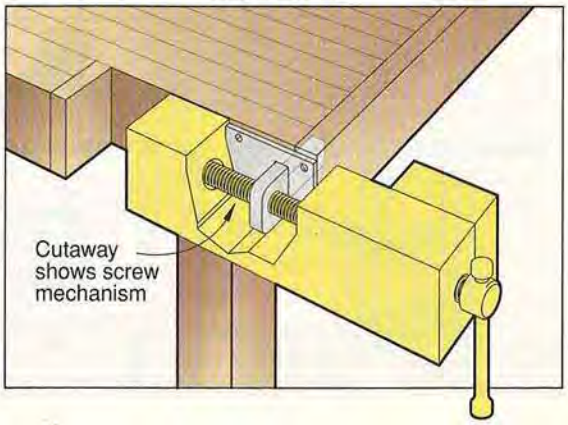
SHOULDER VISE



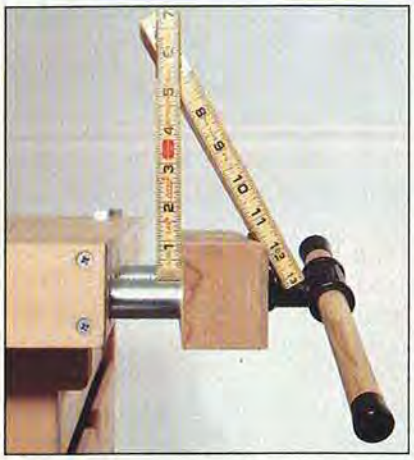
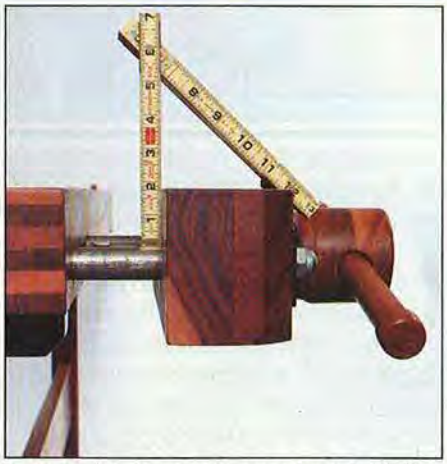
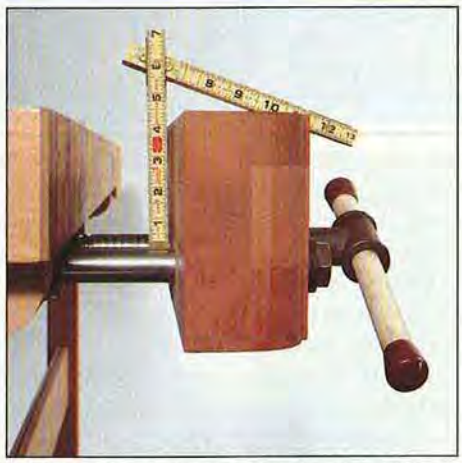
END AND FACE VISE



TAIL VISE



Moving portion of vise

The face and end vises varied in depth from 1" for the Craftsman bench (left) and 1¼" for the Anke, to 1¾" for the African Versatile vise (middle) and two of the Sjobergs. The Sjoberg 2200BS had 3¼"-deep jaws, but the Ulmia face vises (right) were the champs with 4¼" of jaw depth.

vise that are essentially the same. The face vise is located to the far left on the front side of the bench, while the end vise is located on the right end. The end vise typically has longer jaws that cover the full width of the work surface. These general-purpose vises perform most tasks well, with just a couple of limitations. First, the guide rod(s) and screw prevent you from clamping many workpieces vertically. If you place an object vertically on the outside of one of the rods, the vise jaw will rack out of parallel under heavy clamping pressure.

Instead of the end vise, some benches (typically higher-end models) have a ***tail*** vise on the right front corner. These won't rack, so you can exert extreme-pressure with one. The space between the jaws is completely open for clamping workpieces vertically.

One bench in our test, the Sjobergs 1522BS, has a ***shoulder*** vise in place of the face vise. Like the tail vise, the shoulder-vise jaws are open for objects positioned vertically. The shoulder vise won't handle as much clamping pressure as a tail vise, but it has a swiveling pad on the end of the screw for holding tapered or free-form objects.

Although all of the tested tail vises, and the one shoulder vise, were well constructed, we found big differences in the capacity and quality of the face/end vises from bench to bench. As shown in the series of photos *above*, and listed in the chart on *page* XX, the jaws of the face and end vises varied considerably in depth. We found the vises on the Craftsman and Anke benches, with only 1" and 1¼" of depth respectively, too small to hold many workpieces between the jaws. (All of the end vises and tail vises adequately hold objects on the surfaces of the benches when used in conjunction with bench dogs. We'll cover those later.)

As shown in the photos shot facing the underside of the benchtops *below*, the face/end vises also varied considerably in the beefiness of their construction. The Ulmia vises, with all-steel

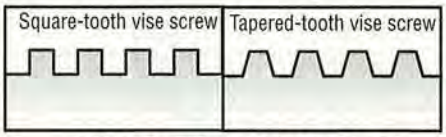
Despite having just one guide rod, the Ulmia vises proved to have the most stable construction in our test.

Although made of beefy components, the African Versatile vises had some slop in the guide-rod assemblies.

The Sjobergs vises were adequate in most regards, with no glaring strengths or weaknesses.

A thin table edge and scanty mechanism reinforcement led to the failure of the Craftsman and Anke vises.

components mounted to a nearly indestructible 5"-thick edge, are the undisputed champs in this category. Among the "little things that count" that we noticed with the Ulmia vises were the square-tooth threads of their screws as shown in the drawings *below*. These threads cost more to manufacture because they have to be machined to exact tolerances for a tight fit. The tapered-tooth



SCREW THREAD TYPES

threads found on all of the other vise screws have more slop from the start and will get sloppier over the years at a faster rate than the square-tooth threads.

The only vises that failed during our tests were the identically constructed face and end vises of the Craftsman bench and the face vise of the Anke model. The unsubstantial table edge and screw-mechanism reinforcement combined to cause the table edge to bow out and delaminate from the top in certain high-pressure clamping situations.

Big and brawny benchtops take the prize

The ideal bench features a flat, thick top made from a hard, stable wood, and has sturdy edges. Although all of the tested benchtops came within 1/32" of being totally flat, we did come across differences in wood type, and in the thickness of the tops and edges. Here's a closer look at each of these critical areas:

• ***Wood type.*** All of the woods used to make the benchtops in our test proved to be durable and fairly stable. None of them warped or delaminated even though we ordered them during a typically humid Midwest summer and wrapped up our testing during dry winter conditions.

Most of the workbench models contain woods commonly used in benchtops, such as red and white beech, and nordic birch. The African Versatile Bench is made of a wood—described as Rhodesian teak by our contacts at Garrett Wade—that we had not seen before. In our tests this exotic-looking wood held up as well as any of the traditional species.

• ***Thickness.*** The surfaces varied from 1" to 3¼" thick, and the edges ranged from 1" to 5" thick. In our trials, the tops and edges less than 1½" thick proved too light to absorb the shock of mallet blows or withstand intense clamping pressure.

And remember, at some point all benches require replaning (as described on *page* 10) to flatten and smooth them. Here too, a thick top adds to bench longevity.

All of the tested benches, except for the Sjobergs 2200BS, have tops made up of one layer of edge-glued stock. The 2200BS has three layers, with a 9/16"-thick veneer of white beech atop two layers of maple. Although we would prefer a thicker top layer, this design does have advantages. First, it allows the manufacturer to make better use of wood (only the top pieces have to be long and flawless). And, the many laminations should lend stability to the top, making it less prone to warp over time.

Bases: Every bench needs a solid foundation

As you might expect, bench manufacturers concentrate more on the benchtops and vises than on building fancy bases. This suited us fine. All of the bases, with the exception of the one on the Sjobergs 1522BS, proved sufficiently solid and rack-free. We experienced racking with the 1522BS regardless of how much we tightened its connecting hardware. The only solution was to add our own diagonal bracing between its legs.

Although several of the benches feature drawers and shelves, we suggest that you not give them much weight when making your buying decision. Many of these parts are made of particleboard and thin plywoods, and have so-so joinery. If you want storage that will last the ages, you're best off building it yourself.

As shown in the photos *below*, the benches in our test use either bolts with captured nuts, or tension rods, to join the stretchers to the legs. Both systems work well, but the tension rods, found only on the Ulmia's, help make a slightly stiffer base. But, we did find that these rods required considerably more snugging up than the captured nuts when we entered drier winter months. Both types of hardware knock down easily for shipping.

Most of the tested benches have bolts and captured nuts that join their stretchers and legs.

Both Ulmia models have tension rods on the top and bottom of the stretchers that tighten to the legs with nuts.

Continued

WOODWORKING BENCHES

The best of the tested benches use the same woods for their tops and bases. Although some of the less-expensive models have lighter-weight pine bases, we didn't find any serious downfalls with them.

African Versatile Bench

Bench dogs: a woodworker's best friend

No matter what your woodworking style, you'll find bench dogs mighty handy. By plugging one or more of these into holes in the vises and benchtops, you can securely hold flat stock for scraping, sanding, relief carving, and other tasks.

And, as you can see in the photo *below*, these "dogs" come in many different breeds. All of them work, but the short dogs on the Anke and Craftsman benches have no springs and can't be adjusted higher than ½" above the benchtop. These do, however, have round shafts, as do the dogs of the Ulmia Cabinetmaker's Bench. Because they can pivot in their holes, these dogs do a good job of securing round workpieces without marring their edges. We found the rectangular dogs more effective with square stock.

Bench dogs from left: Anke and Sears; Sjobergs 25B36, SJ68 and 1522BS; African Versatile Bench; Ulmia Master Cabinetmaker's Bench; Sjobergs 2200BS; and Ulmia Cabinetmaker's Bench.

We were disappointed in the wooden benchdogs on the African Versatile Bench. Although these dogs were less prone to mar workpiece edges, they didn't fit their holes, and their thin wooden springs had a tendency to break.

Anke

Craftsman

Sjobergs 25B36

Sjobergs SJ68

Sjobergs 1522BS

BRAND NAME (1)	MODEL NUMBER	SUPPLIER (2)	SIZE: LENGTH (INCHES)	WIDTH (INCHES)	HEIGHT (INCHES)	WEIGHT (POUNDS)	FLOOR SPACE REQUIRED (FEET) (3)
AFRICAN VERSATILE BENCH*	86A05.02	Garrett Wade	86¾	32	34½	271	10/6
ANKE	000.00.600	Hafele	75	25½	33⅝	79	9/5
CRAFTSMAN**	65560	Sears	60¼	25	33¼	98	8/5
SJOBERGS***	25B36	Woodcraft	35	25	34	50	6/5
	SJ68	Trend-lines	62	27	34	125	8/5
	1522BS	Whole Earth Access	59¼	29⅝	33¼	93	8/6
	2200BS	Whole Earth Access	86	28	34	181	10/6
ULMIA CABINETMAKER'S BENCH	91A02.01	Garrett Wade	88	34½	35¾	300	10/6
ULMIA MASTER CABINETMAKER'S BENCH	25A20	Woodcraft	93½	34	35¾	310	11/6

NOTES:

1. (*) Smaller versions available
   (**) Manufactured by Anke
   (***) Trend-lines, Whole Earth Access and Woodcraft carry a variety of Sjoberg workbenches. Order numbers of the same bench will vary from supplier to supplier.
2. Supplier phone numbers:
   Garrett Wade: 800/221-2942
   Hafele: 800/334-1873
   Sears: Call or visit your local store
   Trend-lines: 800/877-7899
   Whole Earth Access: 800/829-6300
   Woodcraft: 800/535-4486
3. Width x length, allowing for 3' of standing room in front of bench, and 3' for opening end and tail vises.

Our recommendations

It pays to buy a good bench. Not only will a high-quality bench help you with your work, it's also a pleasure to look at and admire. And, a top-quality bench will be an asset to your grandchildren's children long after lesser benches have found their way to a landfill.

If price doesn't deter you, buy an Ulmia bench and you won't regret it. We found the two models in our test about equally matched, but we slightly favor the Master Cabinetmaker's Bench given the slight difference in price (unless you need the extra working sur-

THE LOWDOWN ON BENCHES PRICED FROM $170 TO $1,350

VISES (5)						TOP						BASE		BENCH DOGS			OVERALL RATINGS (11)				
TYPES (4)	JAW DEPTH (INCHES)	JAW LENGTH (INCHES)	MAXIMUM OPENING (INCHES)	PERFORMANCE (6)	ANTICIPATED DURABILITY (6)	MATERIAL (7)	THICKNESS (INCHES)	EDGE BOARD THICKNESS (INCHES)	EDGE BOARD WIDTH (INCHES)	AVAILABLE WORK SURFACE (INCHES) (8)	TOOL TRAY (YES, NO)	MATERIAL (7)	STRETCHER JOINERY (9)	NUMBER OF ROWS	QUALITY (6)	EFFECTIVENESS (6)	STORAGE (10)	PERFORMANCE	VALUE	COUNTRY OF ORIGIN (12)	SELLING PRICE (13)	COMMENTS
F/FE	1 3/4	17 1/4	11	G	G	RT	1 1/2	2 5/16	3 3/8	23 3/4 x 78 3/4	N	RM	3	2	P	F	NONE	8	8	R	$ 695	A heavy-duty, no-frills bench whose beauty goes more than skin deep. What it lacks in bench-dog and vise refinement can be overlooked for its attractive price.
F/FE	1 1/4	13	7 1/2	F	P	WB	1	1	2 7/8	13 1/2 x 69	Y	P	3	1	F	F	*	4	6	G	295*	Optional drawer and cabinet modules allow you to customize its storage capability. Vises have little capacity and won't stand up to heavy clamping pressure.
F/FE	1	13	8 1/2	F	P	WB	1	1	2 1/2	13 1/2 x 55	Y	P	3	2	F	F	C, D, S	5	6	G	399	Similar to Anke but has built-in storage, a smaller top, and costs more. Tool tray and drawer will not stand up to hard use and heavy tools.
F/FE	1 3/4	14 1/4	5	G	F	NB	1	1 5/8	3 1/8	13 1/2 x 29 1/2	Y	SM	2	1	G	E	S	3	5	S	170	Too small and light for hand-tool use or cabinetmaking, but it may be useful if you work in extremely tight quarters. A good kid's bench.
F/FE	1 3/4	14 1/4	5	G	F	NB	1	1 5/8	3 1/8	14 1/4 x 56 1/4	Y	P	2	1	G	E	C, D	6	7	S	370	A good all-around bench for power-tool and light hand-tool work. Plenty of storage in moderately durable drawers.
S/T	*	*	4 3/8	G	G	WB	1 1/4	1 1/2	2 7/8	10 5/8 x 51 3/4	Y	P	2	1	G	E	C, D, S	7	8	S	470	The only tested model with a shoulder vise. It's base did not resist racking well, which limits its hand-tool use unless you reinforce the legs and stretchers.
F/T	3 1/4	23 1/2	6 1/4	G	G	SM/ WB	3 1/4	1 5/8	4 1/4	14 x 79	Y	WB	2	1	E	E	NONE	9	10	S	975	A big, well-made bench with a stable top made up of three laminated layers. Not quite an Ulmia, but will last a lifetime or two.
F/T	4 1/4	20 3/4	5 1/2	E	E	RB	2 1/2	5	4	24 1/4 x 78 3/4	N	RB	1	2	G	G	S	10	10	G	1,250	Like the Ulmia Master Cabinetmaker's Bench, but with a wider and shorter work surface. Has two rows of dog holes for the face vise.
F/T	4 1/4	20 3/4	5 1/2	E	E	RB	2 1/2	5	4	18 1/4 x 84 1/4	Y	RB	1	1	E	E	D	10	10	G	1,350	Like the Ulmia Cabinetmaker's Bench, this one will last for generations. Has a tool tray, drawer, end caps on the top, and a trestle base that the other Ulmia lacks.

4. (F) Face vise
   (FE) Full-width end vise similar to face vise but with dog holes.
   (S) Shoulder vise
   (T) Tail vise
5. Listed dimensions are for face and end vises.
   (*) Shoulder vise has round swivel pad
6. E Excellent
   G Good
   F Fair
   P Poor
7. (NB) Nordic birch
   (P) Pine
   (RB) Red beech
   (RM) Rhodesian muninga
   (RT) Rhodesian teak
   (SM) Soft maple
   (WB) White beech
8. Width x length, not including tool trays and vises.
9. (1) Butt joint with tension rod.
   (2) Butt joint with captured nut.
   (3) Grooved or rabbeted joint with captured nut.
10. (C) Cabinet
    (D) Drawer
    (MD) Multiple drawers
    (S) Shelf
    (*) Modules available with various storage options.
11. Rated on a 1-10 scale with 10 being the highest possible score.
12. (G) Germany
    (R) Rhodesia
    (S) Sweden
13. Catalog price at time of article's production. Shipping charges not included.
    (*) Price without storage modules.

Sjobergs 2200BS

Ulmia
Cabinetmaker's Bench

Ulmia
Master Cabinetmaker's Bench

face of the tool-tray-less Cabinetmaker's Bench).

If you want to keep the price under $1,000, the Sjobergs 2200BS also will faithfully serve several generations of woodworkers. Its vises have high-quality construction, but not on a par with the Ulmia vises. And, its laminated top should prove extremely stable over time.

Even if you can't drop the big bucks, you can still buy a high-quality bench. We feel that the African Versatile Bench, Sjobergs SJ68, and Sjobergs 1522BS represent good value if you can stand a few trade-offs. The African Versatile Bench has the "beef" to take a pounding, but its sloppily fitting vise guide rods may require some tinkering on your part. And, you may want to make your own replacement bench dogs.

Both the Sjobergs SJ68 and 1522BS require some weighting or means of floor attachment if you subject them to handtool use. Even though the base of the 1522BS needs bracing, we can overlook this because of its super-handy shoulder vise and effective tail vise.

Written by Bill Krier Technical consultant: Dave Henderson Illustrations: Kim Downing Photographs: Doug Hetherington

GREAT GOBLETS

Turning a goblet inevitably leads to one thing: turning another. So if you haven't gotten in on the fun yet, now's your chance. We've provided five designs to start you out, but we're sure you'll soon come up with dozens of your own.

Project prep

Stock: Steve DeJong, a woodturner from Colorado Springs, Colorado, who shared his tips and techniques with us for this article, often turns goblets from scraps or found wood. You can turn any of the goblets shown from 2½×2½×8" stock.

Lathe equipment: Spindle centers and chuck or 3-4" faceplate.

Turning tools: ½" spindle gouge, ½" skew, ½" round-nose scraper, ⅛" parting tool.

Lathe speeds: Roughing: 800-1,500 rpm. Finish turning: 1,500-2,400 rpm.

Mount the stock between centers and round it down. On one end, form a tenon to fit your lathe chuck. If you don't have a chuck, make the tenon 1" in diameter and 1" long.

Remove the drive center from your lathe, and attach the chuck to the headstock spindle. Mount the stock in the chuck.

No chuck? Then just attach a 1½"-thick scrapwood auxiliary faceplate to a 3-4" lathe faceplate. Turn the edge and face true, and form a 1"-diameter recess 1" deep in the center. Test-fit the workpiece tenon in this recess as you go—it must fit snugly. Bring up the tailstock to help align the workpiece on center, then glue the tenon into the recess with cyanoacrylate adhesive.

Start with the rough shape

Lay out your goblet and turn the outside to rough shape. To turn the goblets shown *left*, refer to the full-sized templates on *page 98*. Or, you can create your own design. Here are some tips on doing that from woodturner and project designer Steve DeJong of Colorado Springs, Colorado.

"As a general rule," Steve says, "divide the blank into thirds when you lay out your goblet." The top third will become the bowl; the lower part, the stem and foot.

"Ultimately, though, the proportions are up to the turner," Steve hastens to add. "A tall, tulip-shaped bowl with a short stem looks great. And many people like a tall stem with a small, round bowl on top." Look at crystal, silver, and pottery stemware for design ideas and proportions.

Start the rough-turning with the tailstock in position. Shape the side of the bowl and establish the diameter at the rim, following the template. A ½" spindle gouge will do the job. If you're creating your own design, shoot for a rim diameter of between one-third and one-half the goblet's height.

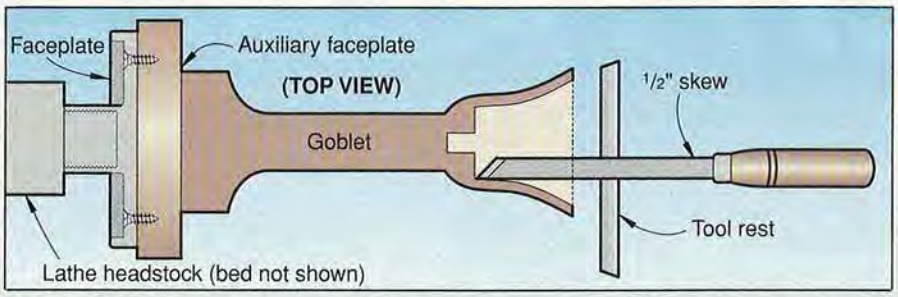
Next, establish the foot diameter. Make it about the same size as or a little smaller than the rim for goblets up to 5" or 6" tall, a little larger for taller ones. Don't turn the stem down to size yet. Leave it thick and stout until you finish clearing out the bowl.

Dig into the bowl

To begin hollowing the bowl, slide the tailstock out of the way, and bring the tool rest around to the end of the workpiece. Set the tool rest height to place the tip of your gouge on the turning's horizontal centerline.

Print this article

GALORE Your turnings will be the toast of the town



Mark the bowl's inside center depth on the tool shank (a piece of masking tape works fine). Then, bore straight into the center of the workpiece, keeping the tool horizontal. Do this in several stages, withdrawing the gouge occasionally so it won't overheat.

Clean out the bowl with successive cuts, working from the center outward. You can use either the gouge or a round-nose scraper at this stage. With the gouge, a smooth spooning motion clears out the waste effectively. When you reach a wall thickness of ¼", set the gouge or scraper aside, and grab your ½" skew.

"I've found that a ½" skew works great for shaping the inside of a goblet," Steve says. Now, taking a skew to an inside wall sounds like the first act in a turning tragedy. But watching Steve smoothly shape the wall made it apparent that he was on to something.

Steve's technique is simple. He lays the skew flat on the tool rest, parallel to the goblet's side, with the long point toward the goblet wall, shown in the illustration *above* and the photo *below left*. Then, he just guides the skew along the inside wall, following the outside shape. Steve cuts only as far as the start of the bottom curve inside the bowl.

Using the skew this way, you can achieve a smooth, thin wall relatively easily. Take light cuts for the best finish. A wall thickness between 1/16" and ⅛" looks nice for goblets of the size shown.

Once you have shaped the sidewall, take up the scraper again to complete the bottom of the bowl. To blend the bottom and sidewall together, make a few sweeping, continuous scraper cuts from the bottom on up the side to the rim. If the tool catches, tilt it slightly—20° or so should work.

Sand and finish the bowl before completing the goblet. Steve finishes his goblets with a homemade mixture similar to padding lacquer—equal parts of shellac, boiled linseed oil, and denatured alcohol. He dampens a folded paper towel with the mixture, then with the lathe running, applies it to the turning. (Dispose of the wet paper towels in a lidded metal container to reduce the risk of spontaneous combustion.)

Lay the skew flat on the tool rest, and cut with just the point on the long side when shaping the inside bowl wall. Go only as far as the curve at the bottom of the bowl.

Support the goblet with your hand as you turn the thin stem. This will help dampen vibrations and lessen chatter.

Make it stand on its own

Now, turn the stem and foot. Following the template, shape the stem. Blend it into the top surface of the foot with a smooth, continuous curve. Form a smooth curve on the bottom of the bowl, too. A small spindle gouge or a skew will work fine for this operation.

As you reduce the stem's diameter, the thin turning may chatter and vibrate—particularly if you're working on a long-stem goblet. To combat this, grasp the tool close to the cutting end with one hand, and place the other hand behind the workpiece to steady it. Hold the blade against the tool rest with the thumb of the hand that's behind the work, as shown *left*.

Sand and finish the stem, foot, and the bottom of the bowl. Allow about ⅛" thickness at the foot's rim, then part off the goblet. You can use your ½" skew here, too, for a smooth cut on the bottom. Angle the tool to form a slightly concave base so the goblet won't rock when you set it down.

Sand and finish the base. Then, sign and date the completed goblet on the bottom.

Project Design: Steve DeJong
Photograph: John Hetherington
Illustration: Kim Downing; Roxanne LeMoine

No"ruff"ing it in this pampered
POOCH PALACE

Smart year-round housing for man's best friend

"Design a doghouse? Sure, nothing to it!" At least that's what I thought before studying the material that the American Kennel Club sent on canine housing. It quickly became apparent that this was going to be a challenge. But I think I've risen to the occasion by working in features (listed below) that guarantee plenty of "creature comforts" for your pet for years to come. Check these out:

- *Insulated walls, floor, and roof for greater comfort in every season.*
- *A removable partition to minimize heat loss in winter.*
- *A door opening in the partition situated 90° from the entry door to avoid icy winter drafts.*
- *An extra-long roof to shade the front deck and protect the entry from rain and snow.*

Here's hoping everything meets with your approval.

Jan Hale Svec
Assistant Design Editor

P.S. I designed our doghouse for a medium-sized dog. To determine the size of house your pet will need, follow these rules of thumb: (1) Make the house 1½ times the length of your dog; (2) the width of the shelter should be ⅔ the length of your dog; and (3) the height should measure 1⅕ times your dog's height measured from the ground to the top of his/her head.

Print this article

Start with the deck and insulated panels

1 Cut the runners (A) and deck boards (B) to size from 2×4 cedar, or redwood. Using the Parts View on the *WOOD PATTERNS*™ insert in the center of the magazine for reference, chamfer each end of each runner.

2 Rip and crosscut the floor panel top and bottom (C) to size from ½" exterior plywood.

Note: *The Bill of Materials does not contain the numerous framing pieces needed to construct the plywood panels for this project. See the Parts View drawing for the layout of the framing on the various panels. To form the framing, we ripped three 1×1½" strips from each of five 8'-long 2×4s.*

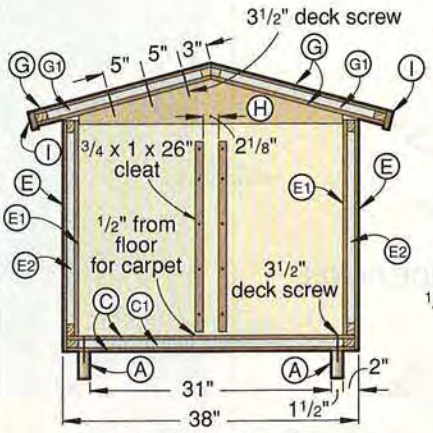
Continued

Bill of Materials

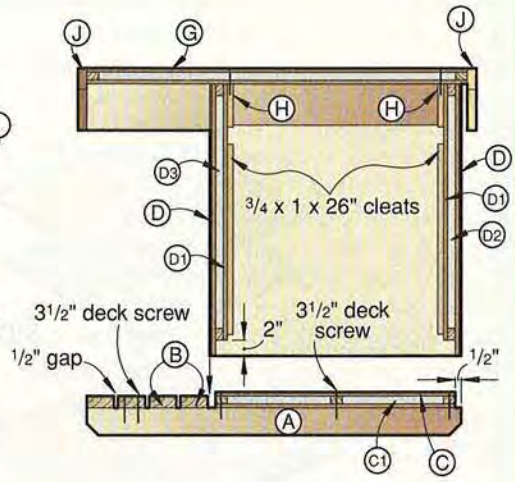
Part	Finished Size* T	W	L	Matl.	Qty.
DECK					
A runners	1½"	3½"	47¾"	C	2
B decking	1½"	3½"	38½"	C	4
FLOOR					
C panels	½"	37"	30¾"	EP	2
C1 insulation	1"	13⅛"	34"	RF	2
FRONT AND BACK					
D outside panel	½"	37"	34½"	EP	2
D1 inside panel	½"	37"	32½"	EP	2
D2 insulation	1"	29½"	34"	RF	1
D3 insulation	1"	17½"	29½"	RF	1
SIDES					
E outside panels	½"	31¾"	29½"	EP	2
E1 inside panels	½"	27¾"	27½"	EP	2
E2 insulation	1"	24½"	24¾"	RF	2
PARTITION					
F panels	½"	32"	27⅝"	EP	2
F1 insulation	1"	24⅝"	29"	RF	1
ROOF					
G top & btm. panels	½"	48"	23½"	EP	4
G1 insulation	1"	20½"	45"	RF	2
H gussets	¾"	5½"	33⅞"	C	2
I fascia	¾"	2¼"	48"	C	2
J fascia	¾"	2¼"	24¼"	C	4
K ridge cap	½"	4¼"	50½"	C	2
DOOR TRIM					
L top & bottom	¾"	2"	15"	C	4
M sides	¾"	2"	20¾"	C	4

Materials Key: C–cedar, EP–exterior plywood, RF–1"-thick rigid foamboard.

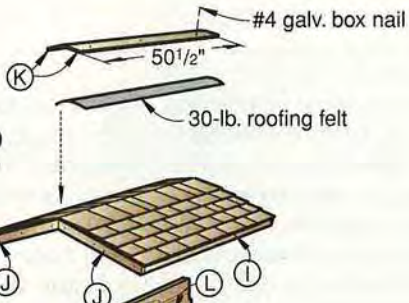
Supplies: 1¼" and 3½" galvanized deck screws; #4 galvanized box nails; #6 galvanized finish nails; construction adhesive; 30-lb. roofing felt; one bundle of 16" cedar shingles; indoor/outdoor carpet; exterior stain or primer and paint.



FRONT SECTION VIEW

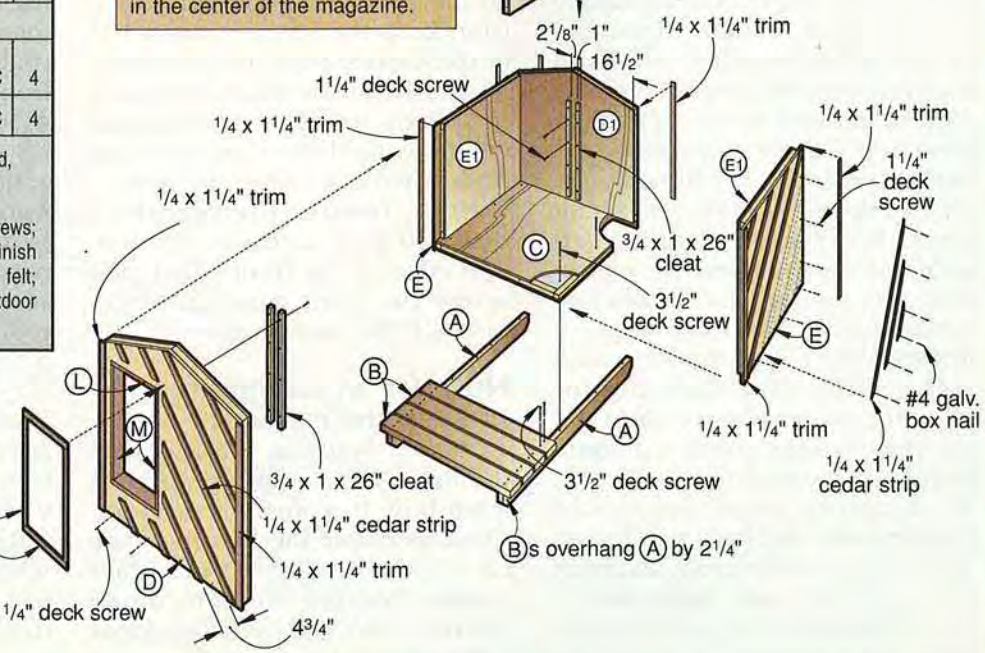


SIDE SECTION VIEW

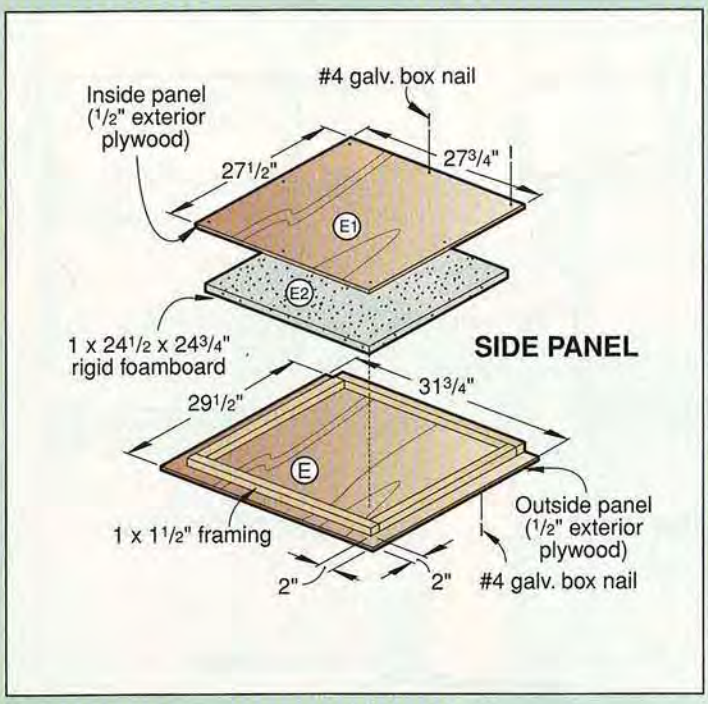


EXPLODED VIEW

For dimensioned drawings of the runners, panels, and gussets, see the Parts View drawing on the *WOOD PATTERNS* insert in the center of the magazine.



POOCH PALACE



Screw the side panels to the floor and back panels. A scrap strip helps hold the side panels upright and square.

3 Crosscut the floor-panel framing pieces to length. With the outside edges flush, glue and nail the 1×1½" framing pieces to one of the ½" plywood panels (C). Now, fit the 1"-thick rigid foamboard insulation (C1) between the framing strips, and glue and nail the other plywood panel (C) in place. Immediately clamp the entire assembly flat until the glue dries. See the Side Panel drawing *above* for reference. (Much of our ½" plywood was warped. To avoid warped panels, we added the 1×1½" framing to one piece of plywood. Then, we fitted the insulation in place. Finally, we glued and nailed the remaining piece of plywood in place, and immediately clamped the entire assembly flat on our workbench until the glue dried.)

4 Using the Exploded View and Side Section View drawings for reference, screw (don't glue) the assembled floor panel and deck boards (B) to the runners (A).

5 Using the same procedure described for the floor panel, construct the insulated front and back (D), sides (E), and partition (F). Note that the front and partition panels each have an opening and that the inside plywood panels for the sides, front, and back are sized slightly smaller than the outside panels used for these parts.

6 Drill countersunk screw mounting holes, and screw the side panels and then the back panel to the floor panel and to each other. Note that the front edge of the side panels protrude ½" beyond the front edge of the floor panel. So the trim strips will hide them later, keep the screws within 1¼" of the outside edge of each panel. As shown in the photo *above*, a scrap strip nailed to the side panels helps hold them upright and flush when assembling the unit.

7 Next, remove the rear deck board to gain access to the bottom edge of the front panel, and screw the front panel in place. Reattach the deck board.

Now, for an insulated roof to keep the rain out

1 Start by studying the Roof and the Roof Front View drawings to learn how to construct the roof. Then, assemble the two roof panels (G, G1) as you did the other panels, *keeping the nails along the edge that will be bevel-ripped at least 1" from that edge.*

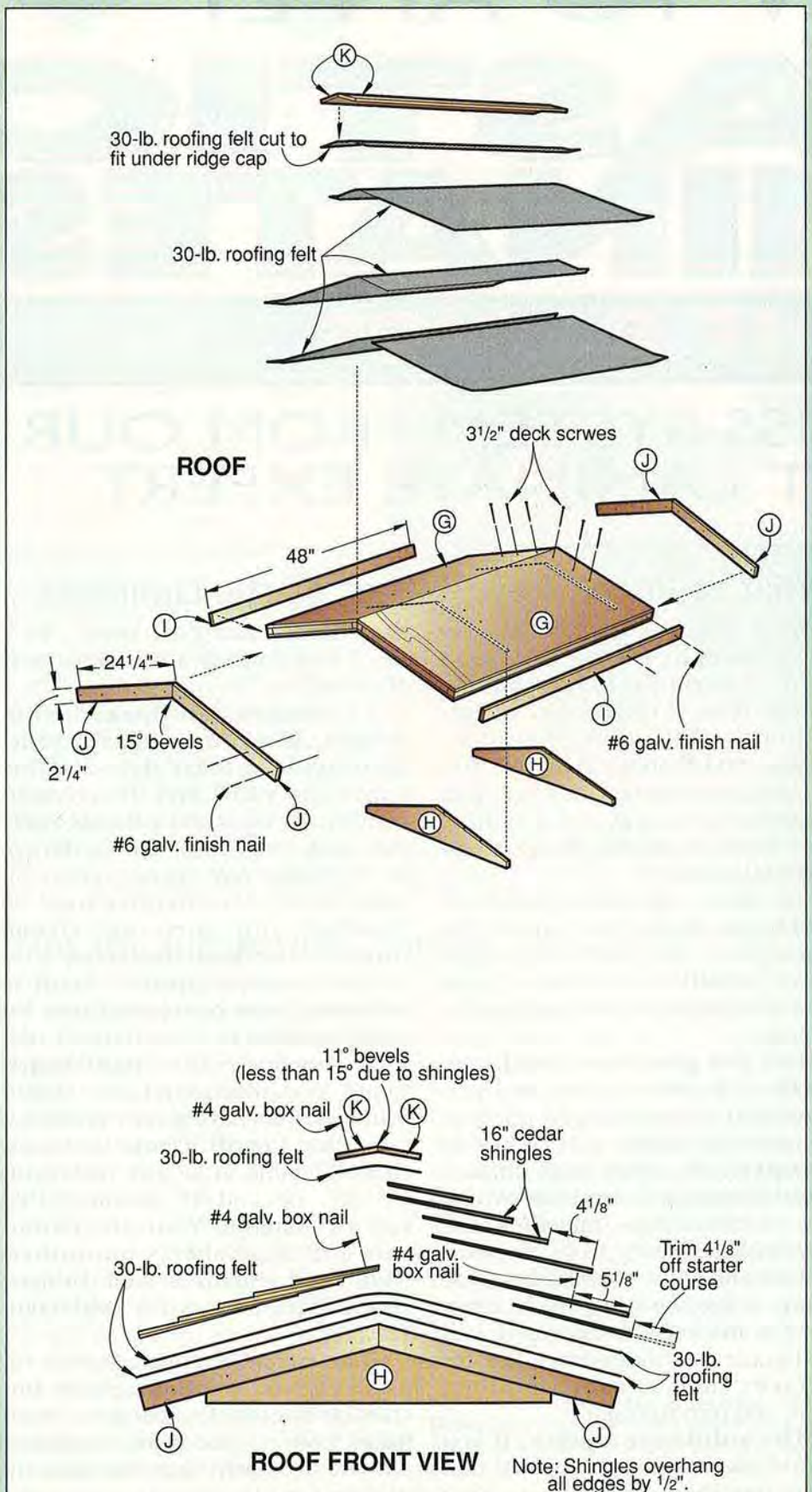
2 Tilt your portable circular saw to 15° from vertical. Clamp a straightedge to one panel, and bevel-rip the top inside edge of each roof panel.

3 Cut the two cedar gussets (H) to the shape shown on the *WOOD PATTERNS*™ insert. Turn one roof panel bottom side up, align the gussets where shown on the Roof and Side Section View drawings, and glue and temporarily toenail the gussets in place. Note that the gussets fit *inside* the front and back panels.

4 Turn the panel/gussets assembly over, and apply construction adhesive along the mating bevel-ripped joints of both roof panels. Next, position the second roof panel tightly against the first, and screw through the top of both roof panels to secure the gussets.

5 Cut the fascia (I, J) to size from ¾" cedar. Using construction adhesive and #6 nails, adhere the fascia pieces to the roof, keeping the top edge of the fascia flush with the top edge of the roof.

6 Refer to the Roof Front View for where to apply the 30-lb. roofing felt. Then, staple it to the roof, trimming it flush with the outside edges of the roof.



7 Trim 4⅛" off the thick end of enough 16" cedar shingles to do the starter course along both bottom edges of the roof where shown on the Roof Front View drawing at *right*. Nail the starter course to the roof. Now, nail the remaining courses, making sure to space the shingles ¼" apart, stagger from one course to the next, and allow for a 4⅛" exposure. The overhang of the shingles should be ½" on all edges.

8 Cut a piece of builder's felt to 8¼×50½", and center it on top of the roof. Now, cut the ridge cap pieces (K) to size, bevel-ripping the inside edge of each at 11°. Nail the pieces in place, running a bead of construction adhesive along the mating beveled edges.

Add the door trim and partition supports

1 Cut the door trim pieces (L, M) to size, and nail them in place.

2 To support the partition vertically when in use in the winter, cut the interior cleats to the sizes shown on the Front Section View and Exploded View drawings, and screw them in place.

3 Cut 90' of ¼×1¼" strips for the corner and decorative trim. (We planed cedar 2×4s to 1¼" thick, positioned the tablesaw fence ¼" from the blade, and ripped as many strips as possible from each 2×4.) Measure the lengths of pieces needed, cut to length, and nail the corner trim to the doghouse where shown on the Exploded View drawing. Then, miter-cut the angled decorative trim to length and attach it.

4 Stain or paint the exterior of the doghouse where shown on the opening photo. (We used Thompson's arbor green Wood Protector Colorfast Stain.) Don't forget to seal the bottom of the bottom panel (C). It's not necessary to paint the inside of the doghouse or the partition.

5 Add indoor/outdoor carpet to the doghouse interior floor.

Written by Marlen Kemmet Project Design: Jan Hale Svec Illustrations: Roxanne LeMoine Photographs: John Hetherington

HOW TO APPLY PLASTIC LAMINATES

— THE BASICS —

A CAN'T-MISS SYSTEM FROM OUR RESIDENT LAMINATE EXPERT

Plastic laminates have long been a popular choice for surfacing applications throughout the home...with good reason. They're attractive, durable, and sensibly priced. Here's how to successfully apply this material.

Print this article

What to know about buying plastic laminates

Although many people refer to plastic laminates by the popular brand name of Formica, today you can choose from several other brands including Wilsonart, Nevamar, Micarta, and Pionite. Typically, you can purchase plastic laminates from a lumber outlet, but you may have to pick up the material from a local distribution center.

Your dealer will have hundreds of samples to choose from, and in this article you'll see just some of the many possibilities. Keep these points in mind as you pick out a laminate:

•**Get the grade to match the surface.** In most colors and patterns, you choose general-purpose laminates in either *horizontal* or *vertical* grades. As its name implies, a horizontal-grade laminate works best on countertops, tabletops, and other surfaces likely to be exposed to wear and abuse. Horizontal-grade laminates are about 1/16" thick, about twice as thick as less-expensive vertical-grade laminates intended for surfaces such as cabinet doors, walls, and furniture sides.

•**The solid-core option.** If you would like to avoid the tell-tale black line that appears just under the surface of typical laminates, you can choose plastics that feature a solid color throughout. However, these materials cost more, and you'll find them in a limited variety of colors.

•**Finishes to dazzle and delight.** About 90 percent of plastic laminates sold today have a matte finish, and you'll find the greatest number of colors and patterns available with this finish. But as shown in the *lower left* corner, you can select from other finishes such as "leather" and "meteore" (from Formica). Our local distributor tells us that Formica's "sparkle" finish is becoming more popular because its small-pebble surface helps hide scratches under the bright lights found in modern kitchens. Other manufacturers have similar finishes.

•**A size for all.** Plastic laminates typically come in factory widths of 30", 36", 48", and 60", and in 8', 10', and 12' lengths. Your distributor may cut these sheets into other widths and lengths as well. Dealers also sell edge strips 1⅞" wide and 12' long.

•**The price is right.** Expect to pay $1.25–$2 per square foot for standard colors and patterns. Balance sheet, (the brown laminate with no decorative face that goes on the underside of laminated substrates), costs about half that. Solid-core and metalic laminates range up to $7 per square foot.

Smooth surfaces start with well-prepared substrates

Just as a sturdy building sits on a solid foundation, your plastic-laminated projects need a solid underlying surface (known as a substrate) for good looks that last. Particleboard makes an ideal substrate for most projects because it's flat, solid, inexpensive, and has an expansion rate similar to plastic laminates. For the how-to photos on the following pages we used a high-quality fir plywood only because we wanted the table to be stronger and lighter than particleboard construction would have made it. For countertops with sink cutouts we suggest you use an exterior-grade medium-density fiberboard (MDF). This material will not readily deteriorate if water creeps through a joint line.

Whatever material you choose, the substrate must be flat, smooth, free of voids, and clean, with crisp, square edges. Otherwise, the plastic may look bumpy, may separate from the surface, or may fracture when struck by an object.

To avoid these unpleasant surprises, follow these tips when preparing the substrate:

•Use No. 8 flathead screws to join ¾"-thick particleboard or plywood workpieces at right angles, and be sure to pre-drill the screw holes to prevent the substrate from bulging. Drive the screwheads flush or slightly lower than surrounding surfaces. It's also a good idea to fill the screw holes with putty and sand them flush if you plan to cover the surface with a vertical-grade laminate.

A piloted flush-trimming bit helps you quickly trim edges flush with adjoining surfaces.

•Cut your substrate pieces slightly oversized, and trim them flush with adjoining surfaces as shown in the photo *left*. Never use a power sander to trim edges—despite your best efforts you'll probably wind up with wavy surfaces and rounded-over edges.

•With a hardwood block and 80- or 100-grit abrasive, lightly sand all surfaces just enough to knock off any rough spots. Finally, run your hand over the surface to feel for high spots, and thoroughly vacuum away all debris.

Tips for successfully cutting the laminate to size

To allow for trimming later, cut all of your laminate pieces at least 1" longer and wider than their mating substrate surfaces. When covering a large surface such as a tabletop, you may want to allow for even more trimming material, especially with your first attempts at laminating.

If you have a tablesaw and a carbide-tipped blade with at least 60 teeth (in a 10" size), we recommend that you cut your laminates to size as shown *right*. You'll get fast, clean cuts this way. Note in the photo that we positioned the laminate good face up, and drilled a hole at the intersection of two cuts forming an inside corner. This prevents stress cracks that can spread out from a nonradiused inside corner.

You also can get chip-free cuts by running a router with a straight bit, or by cutting with a laminate scoring knife, along a clamped straightedge. With the scoring knife, make enough passes to cut completely through the colored portion of the laminate before lifting it up to snap it. With solid-color laminates, score to a depth of at least one-third of the way through the material.

To prevent laminates from slipping beneath your tablesaw's fence, cut a piece of ⅛"-thick plywood so it lies flat on the table and surrounds the fence.

Continued

LAMINATE BASICS

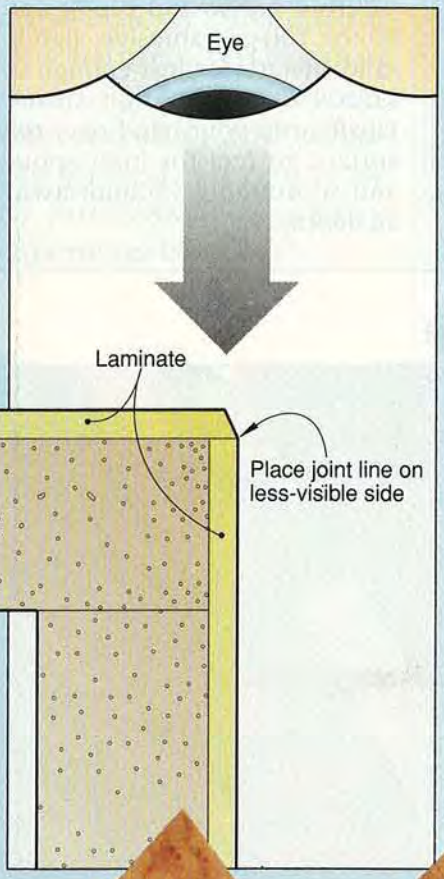
Here comes the fun part: applying the laminate

Now, plan the sequence in which you apply the laminate pieces so as to minimize the appearance of dark joint lines where the laminate meets. Generally, this means you should apply and trim the less-visible pieces of laminate first, then repeat this procedure for the more-visible pieces. Done this way, the more-visible pieces will overlap the edges of the less-visible pieces as shown *below*.

As an example, with the parsons table shown in this article, we adhered balance sheet to the underside of the tabletop first (to stabilize the substrate by preventing uneven moisture absorption), then applied laminate to the back sides of the legs. We trimmed these pieces, and then moved on to the outsides of the legs, and finally, the top. With countertops and tabletops, always adhere and trim the edges before the tops.

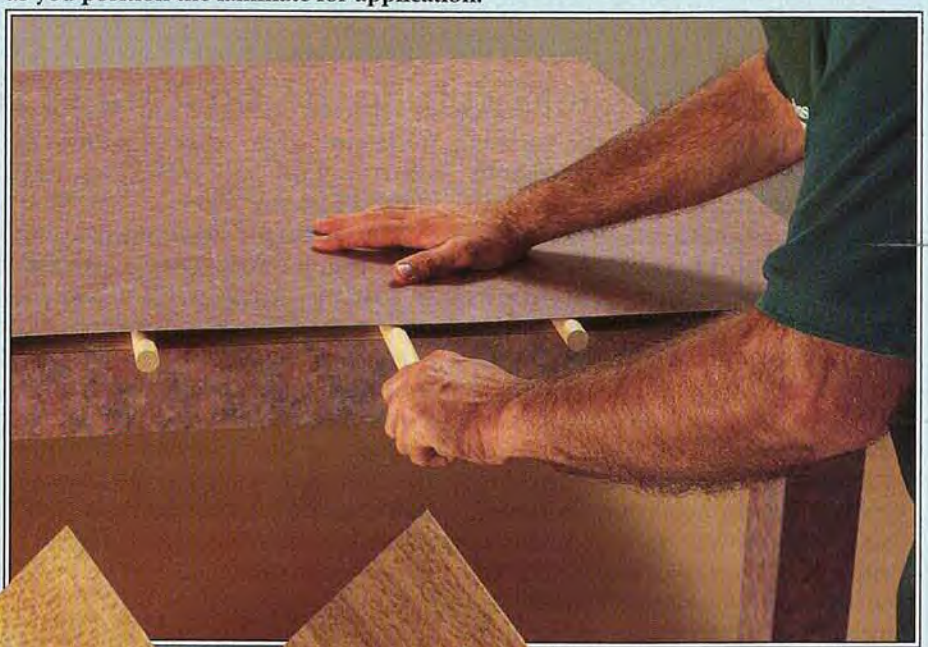
Next, apply a uniform layer of contact adhesive to the back side of the laminate with a short-nap roller as shown *below*. Set this aside, and apply the adhesive to the mating substrate surface (particleboard edges require two coats). Cover the roller and pan to keep them from drying out.

Now, test applied adhesive for dryness by touching it with the back of your fingers (the front of your fingers may have oils or other contaminates). When the



To conveniently apply adhesive with a short-nap roller to a piece of laminate, place the laminate face down on its mating substrate.

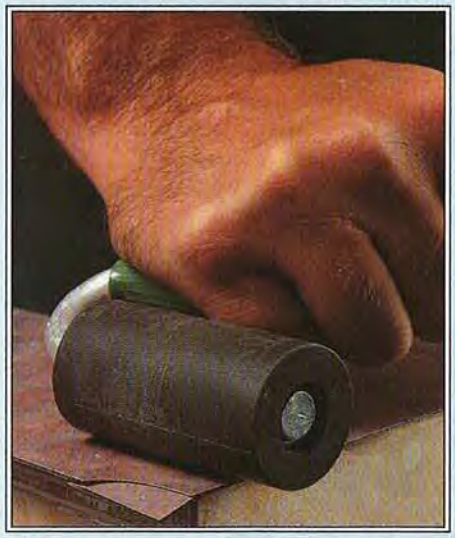
Use ½"-diameter dowels to separate large pieces of laminate and mating substrates as you position the laminate for application.



adhesive is no longer tacky, lay the laminate on its mating surface. Be extremely careful to leave yourself trim material on all edges. It's difficult and messy to separate the two materials with a solvent (such as lacquer thinner) once the adhesive makes contact, so don't rush this step.

Large tabletops and countertops can be especially tricky to align correctly, so place dowels on the substrate as shown *left bottom*. Lay the laminate on top of the dowels, align the laminate, and work out from the center as you withdraw the dowels and press down the laminate by hand. Old venetian-blind slats also work well in place of the dowels.

Firmly adhere the laminate with a hard-rubber hand roller. Be careful not to roll too far over the edge of the substrate and break the laminate as shown *below*. The break may extend over the substrate, and you'll have to remove the laminate. What a hassle!



Oops! If you accidentally go over the substrate edge with your hard-rubber hand roller, you may break the hard, but brittle, laminate.

Pick your bit: It's time for a trim job

After applying a piece of laminate, you need to trim it flush with the substrate. For this task we use a flush-trimming router bit with a ball-bearing pilot as shown *right*.

To trim laminates, you can choose among router bits with or without ball-bearing pilots. The photo *below* shows both varieties for flush and bevel trimming. We prefer the bits with bearings. Why? The solid-carbide bits have pilots that spin at the same speed as the cutting edge, so they invariably leave a faint trail on the laminate. We've tried all of the tricks for avoiding this, such as applying paraffin wax or masking tape to the laminate, but only with limited success. To us, the advantages of the bits with ball-bearing pilots more than make up for their added expense and hav-

Continued

When trimming with a straight bit, set its depth so its pilot does not go into any slight indentations from countersunk screws.

Solid-carbide flush-trimming bit
Bevel-trimming bit with ball-bearing pilot
Flush-trimming bit with ball-bearing pilot
Solid-carbide bevel-trimming bit

Bevel-trimming and flush-trimming bits come with or without ball-bearing pilots. Ball-bearing types are less likely to mar your plastic laminates.

LAMINATE BASICS

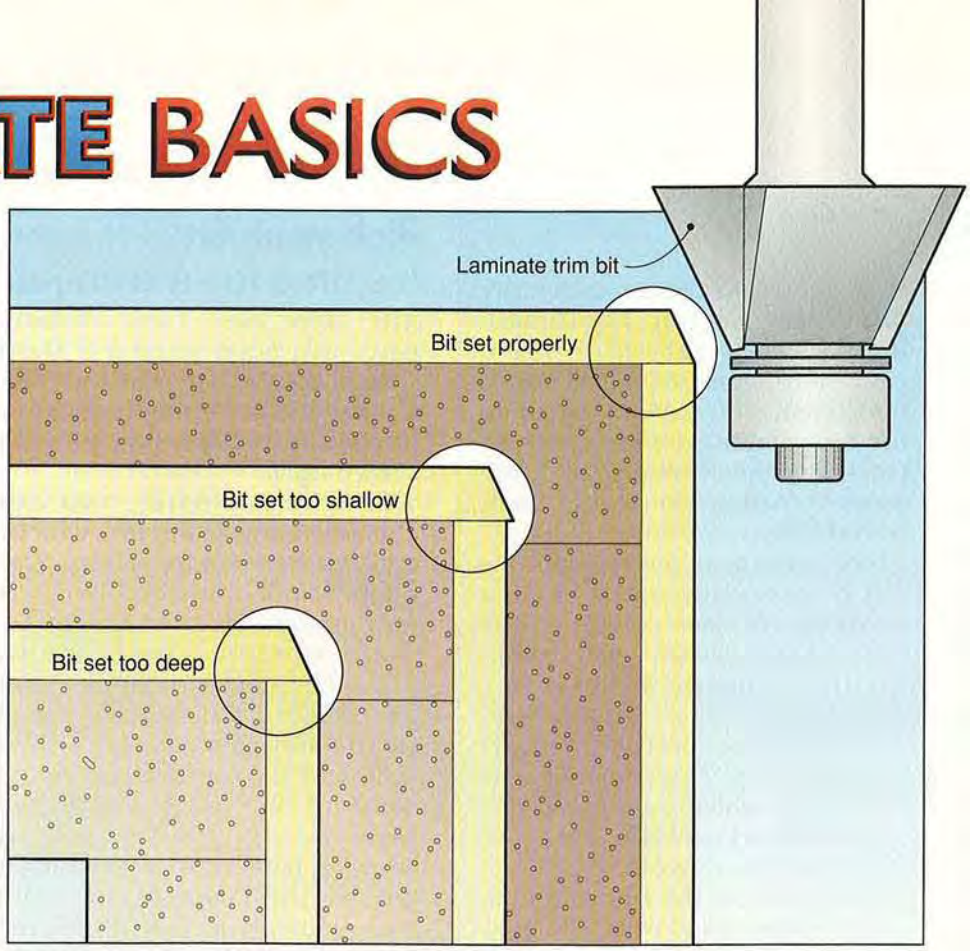
ing to occasionally clean dried adhesive from the ball bearing.

Note: *Router-bit bearings may stop turning if dried adhesive builds up on them. To prevent this, spray your router bits lightly with WD-40 or a similar lubricant before you start. If the buildup occurs anyway, stop what you're doing and scrape off the glue with a scrap of laminate. If you need to use solvent to loosen the adhesive, remember to add a drop of lubricant to the bearing before restarting.*

Next, with a laminate file (available from plastic-laminate distributors), smooth the edge of the laminate flush as shown *below right*. (A mill bastard file works in a pinch, but will clog faster.) Be careful to apply pressure only when you're pushing the file away from you while drawing it along the edge. Lift the file up as you pull it back so you don't chip the laminate edge.

With your first pieces of laminate applied, you next move on to laminating adjoining surfaces. The edges of these next pieces will overlap the edges of the already-applied laminate, so you need to bevel-trim these edges for best appearances. To do this, use a piloted router bit that cuts a 10°–25° bevel. Practice this procedure on a scrap of laminated substrate as shown *above right*.

Finally, lightly smooth the beveled edge with a laminate file or sanding block with 150-grit abrasive. Go gently so you don't mar the laminated surface.



Only stroke the file away from yourself as you smooth the trimmed edges.

How to give your edges the royal treatment

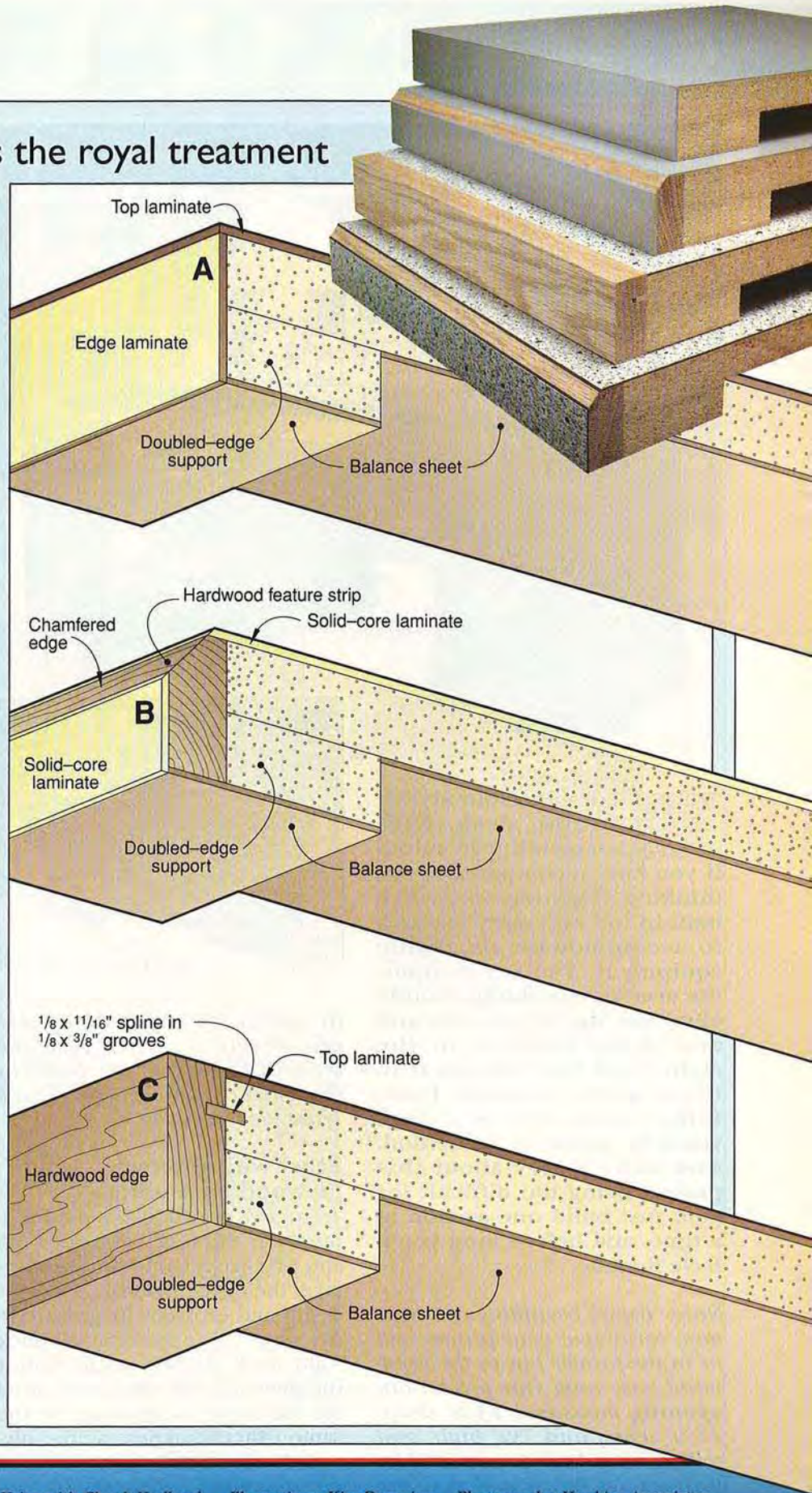
To add a polished look to your tabletop or countertop projects, try one of the basic edge treatments shown *right*. (Note that the bottom edge in the photo is constructed the same as the second-from-top edge. We made these to show you the difference in appearance between general-purpose and solid-color laminates.)

No matter which edge you choose, you should start the assembly process by doubling the thickness of the top along its edge. To do this, glue and clamp a 2"-wide strip of the substrate material onto the bottom side of the top, with the strip protruding about 1/16" from the edge of the top. After the glue dries, trim the strip flush with the top.

To make the chamfered edge (sample B), glue a strip of hardwood onto the doubled edge support and trim it flush with the top and bottom of the doubled edge. Apply and trim the balance sheet. Next, adhere laminate to the top and edge.

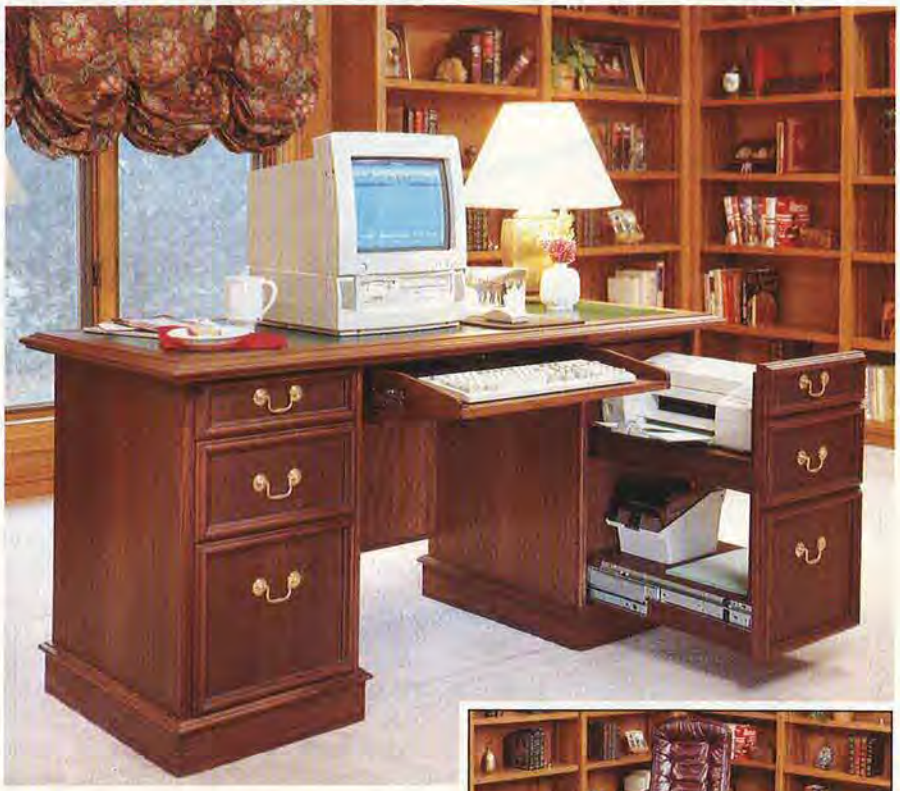
Then, rout the edge with a chamfer bit to expose the hardwood feature strip. To avoid chipping the laminate, make at least four light, "climb-cutting" passes. This means running the router from right to left, the opposite direction of how you typically feed a router. This works safely and controllably so long as you remove no more than 1/32" of material with each pass.

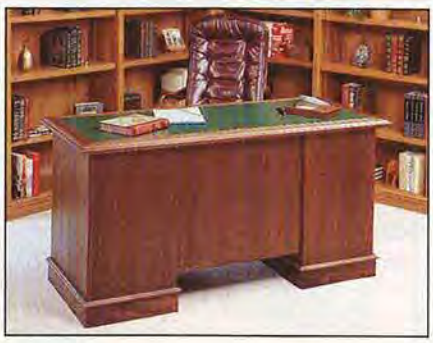
To make a hardwood edge (C), apply the top laminate and balance sheet, and trim these flush with the doubled edge. Rip a hardwood edge that's exactly as wide as the height of the edge (with applied laminate and balance sheet). With a slotting cutter, rout a groove into the hardwood edge and top. Join the edge and top with glue and a spline. The spline aligns the edge, so you shouldn't have to trim it (which could mar the top laminate).



Written by Bill Krier with Chuck Hedlund Illustrations: Kim Downing Photographs: Hopkins Associates

CUTTING-EDGE COMPUTER





We designed our stylish walnut desk with adaptability in mind. If you have a computer or are thinking of getting one, we've built in the necessary features to accommodate electronic equipment. You say computers aren't your thing? Simply eliminate the printer bin and add three drawers to the right-hand base identical to those in the opposite base. Either way, this is a desk you'll be proud to sit behind. And don't worry about this project being too difficult for you. Just build one section at a time, and before long you'll have it made.

Note: *Before beginning construction, verify that your printer will fit in the printer bin in the right-hand base unit. Our printer-bin opening measures 13¼" deep, 17¾" wide, and 7¾" high, and will fit most laser printers. Older printers are larger and may not fit. Adjust the bin and base size accordingly, if needed. Also, see the WOOD PATTERNS™ insert in the center of the magazine for the Front View drawing.*

Start with the two plywood base units

1 From ¾" plywood (we used walnut), cut the four base sides (A) and two backs (B) to the sizes listed in the Bill of Materials.

2 Rip and crosscut the base corner strips (C) to size from ¾"-thick solid stock. For a good fit against the plywood, the solid stock used for the corner strips must be the same exact thickness as the plywood; plane before ripping and crosscutting, if necessary.

Continued

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
BASE UNIT					
A sides	¾"	20½"	24¼"	WP	4
B backs	¾"	14¼"	24¼"	WP	2
C corners	¾"	¾"	24¼"	W	8
D cleats	¾"	2"	14¼"	W	4
E* trim	¾"	1⅝"	17⅛"	W	4
F* trim	¾"	1⅝"	23⅜"	W	4
G subbase	¾"	3½"	16¼"	W	4
H subbase	¾"	3½"	22½"	W	4
BACK PANEL AND STRETCHERS					
I back panel	¾"	24½"	21½"	WP	1
J band	¾"	¾"	24½"	W	1
K stretchers	¾"	2½"	24½"	W	4
TOP					
L* substrate	⅝"	20"	54"	PB	2
M* front & back trim	1⁵⁄₁₆"	3"	60"	LW	2
N* side trim	1⁵⁄₁₆"	3"	26"	LW	2

Initially cut parts marked with an oversized. Then, trim to finished size according to the how-to instructions. Also, length is always measured with the grain.

Materials Key: WP–walnut plywood, W–walnut, PB–particleboard, LW–laminated walnut.

Supplies: ⅛" stock for splines; #8x1¼", #8x1½", #8x2", #8x2¾" flathead wood screws; #6x1¼" pocket-hole screws; plastic laminate; balance sheet; contact adhesive; clear finish; and items listed in the Buying Guide *below*.

Buying Guide

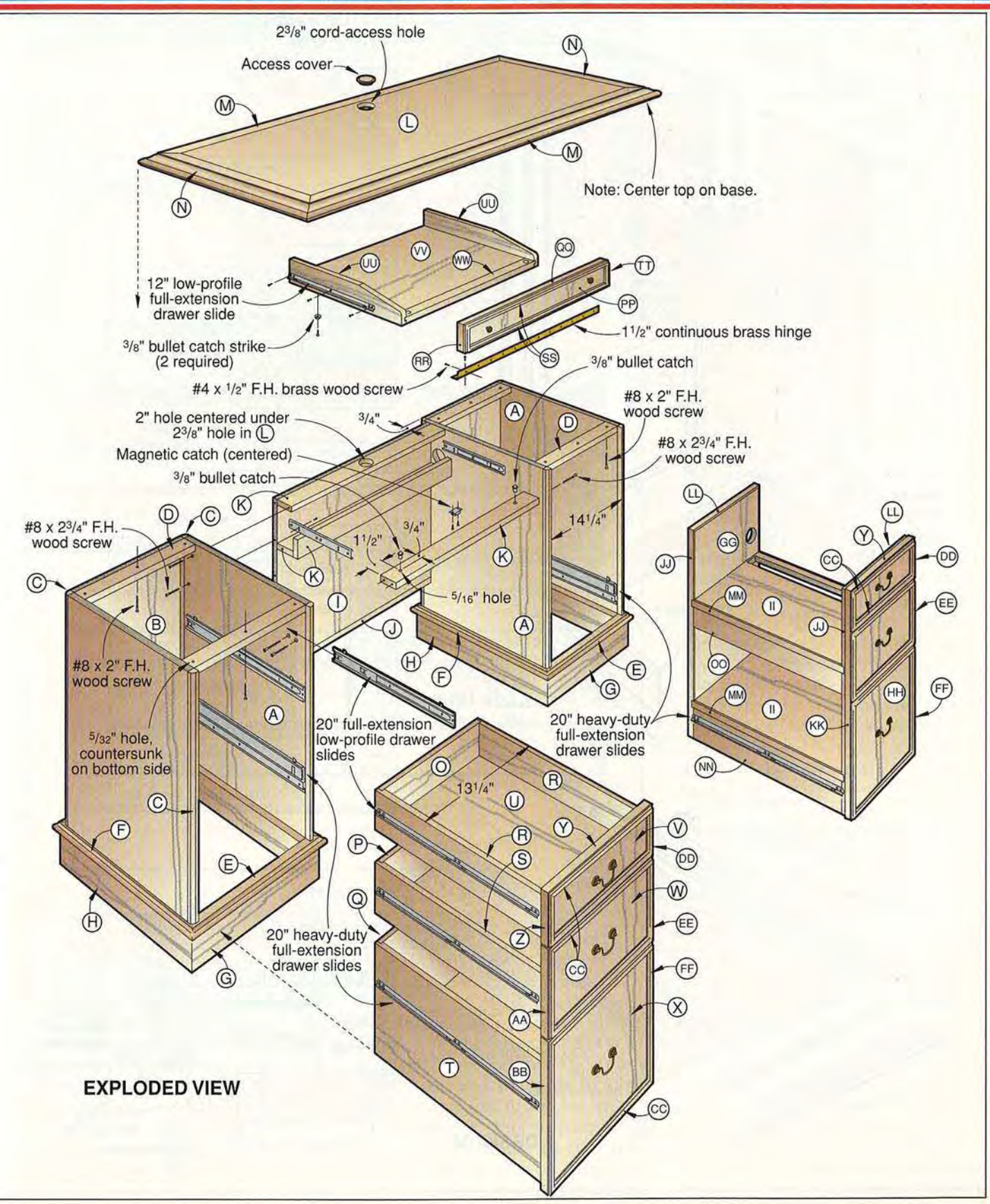
Desk hardware kit. One pair of 12" full-extension drawer slides (#AS2712) for the keyboard drawer; two pair of 20" full-extension drawer slides (#AS2720) for the top two drawers in the left-hand base; two pair of 20" full-extension drawer slides (#AS4020), one for the file cabinet drawer and one for the printer bin, six solid-brass bail pulls (SBH35), two 1" contemporary brass knobs (#SBH85), antique brass finish 24" piano (continuous) hinge (#SK24B), two ⅜" bullet catches (#75B11A), cord-access hole cover, magnetic catch and strike plate, paper grommet (#HAF158), plastic cable grommet (#HAF128). Constantine's, 2050 Eastchester Road, Bronx, NY 10461, or call 1-800/223-8087 to order.

Router bits. 2½" (large-diameter) classical ogee bit (#8563) $37, 1½" (large-diameter) classical bit (#792), $25; ¼" round-over (#352), $14; ¼" beading bit (#452) $14, and flush trim bit (#500) $7. MLCS, P.O. Box 4053, Rydal, PA 19046. Call 1-800/533-9298 to order.

Print this article

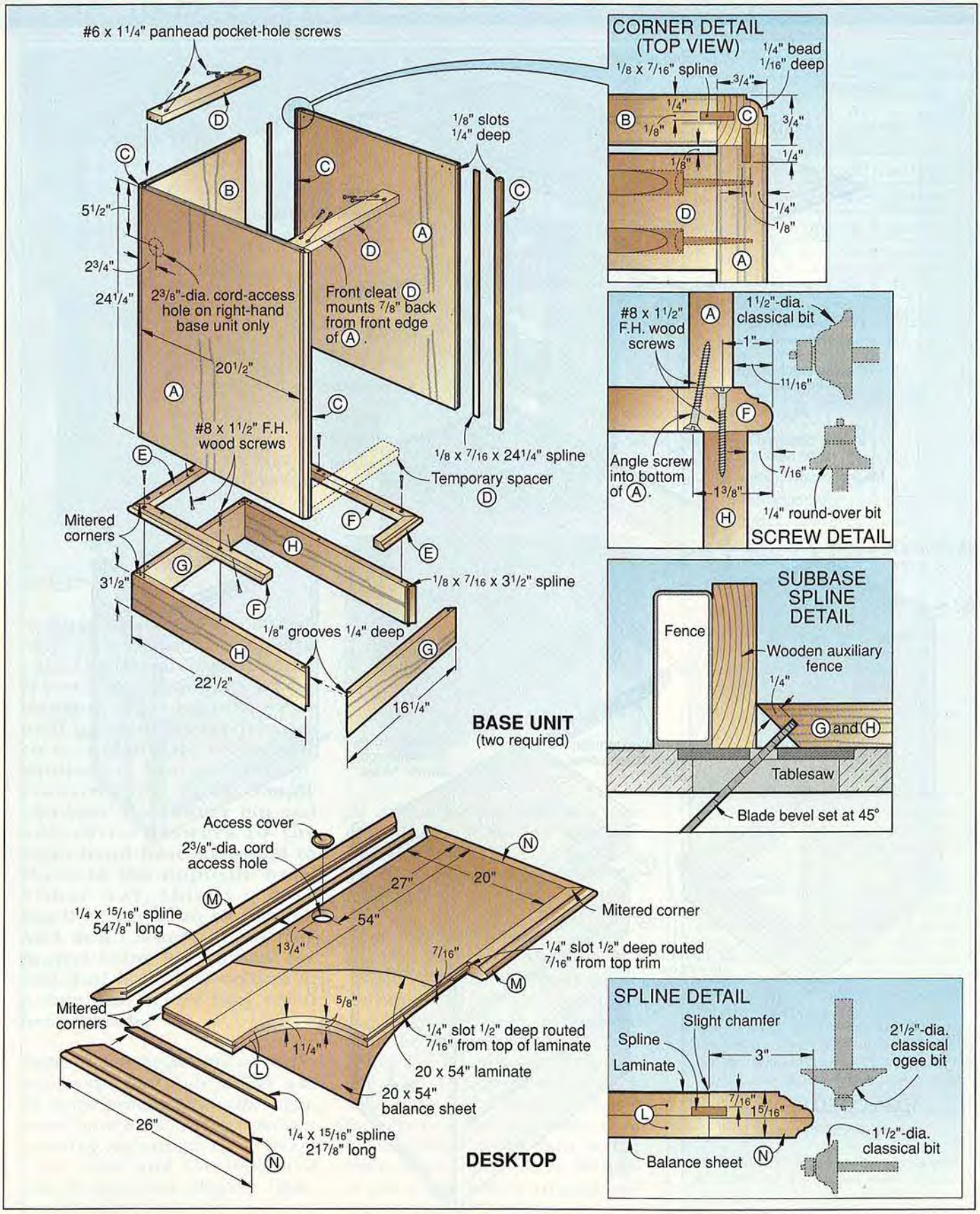
DESK

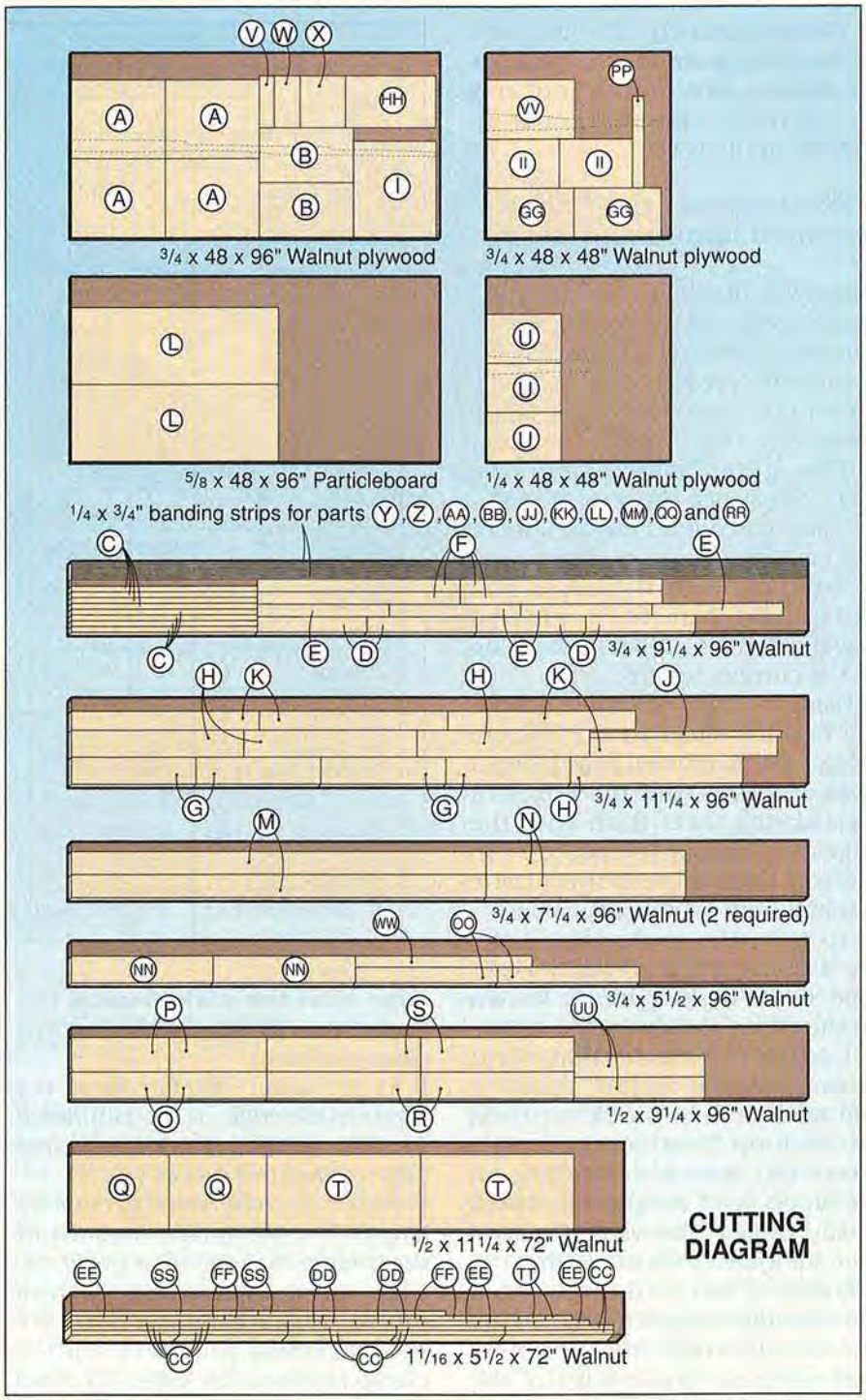
Traditional styling, high-tech features–this project has it all!



EXPLODED VIEW

COMPUTER DESK




3/4 x 48 x 96" Walnut plywood
3/4 x 48 x 48" Walnut plywood
5/8 x 48 x 96" Particleboard
1/4 x 48 x 48" Walnut plywood
1/4 x 3/4" banding strips for parts (Y), (Z), (AA), (BB), (JJ), (KK), (LL), (MM), (QQ) and (RR)
3/4 x 9 1/4 x 96" Walnut
3/4 x 11 1/4 x 96" Walnut
3/4 x 7 1/4 x 96" Walnut (2 required)
3/4 x 5 1/2 x 96" Walnut
1/2 x 9 1/4 x 96" Walnut
1/2 x 11 1/4 x 72" Walnut
1 1/16 x 5 1/2 x 72" Walnut
CUTTING DIAGRAM

3 From ⅛" plywood or hardboard, cut 12 splines to ⅛×7⁄16×24¼". See the Exploded View and Base Unit drawings for reference.

4 Position the blade and fence on your tablesaw so the blade will cut a ⅛" slot ¼" deep, ¼" from the *outside* face along the edges of the plywood panels (A, B) and corner pieces (C) where shown on the Base Unit drawing and accompanying Corner detail. Using a featherboard to keep the pieces firmly against the fence, test-cut scrap stock first to verify the settings and fit of the splines. Now, cut the slots in parts A, B, and C. Note that the two back corner pieces (C) of each base get two splines in adjacent edges.

5 With the edges and ends flush, glue, spline, and clamp two corner strips (C) to each side panel (A). Immediately wipe off excess glue with a damp cloth. Later, remove the clamps. Being careful not to sand through the thin veneer, sand the corner strips flush with the inside and outside faces of the plywood.

6 Bore a 2⅜" cord-access hole through the panel that will be used as the inside panel on the right-hand base unit where shown on the Base Unit drawing.

7 Cut six cleats (D) to size. You'll use the two extra as spacers when assembling the bases. With a pocket-hole jig (see our review of these in the January 1995 issue), drill a pair of angled mounting holes through both ends of each top cleat (D).

8 Glue and clamp the back panels (B) and cleats (D) between the side assemblies A/C. Check for square. Use the extra cleat as a temporary spacer to hold the front bottom ends of the base apart until the glue dries. The position of the temporary spacer is shown on the Base Unit drawing. Drive the screws to secure the cleats in place.

9 Using a ¼" beading bit, rout a bead like that shown on the Corner detail along the outside edge of the four corners of each base unit.

Now, add the subbases to the base units

1 Cut 16' of ¾" walnut to 1⅝" wide for the trim strips (E, F).

2 Using the Screw detail accompanying the Base Unit drawing for reference, use the two bits shown to rout one edge of each lineal strip to the profile shown. Set the strips aside for now.

3 Cut subbase parts (G, H) to size, mitering the ends. Using the Subbase Spline detail for reference, spline the mitered ends. Glue and spline the subbases together, checking for square.

4 Miter-cut the trim strips (E, F) to length from the lineal routed

Continued

Use 6"-long bits to drill the angled mounting holes through the subbase trim and into the bottom of the base.

strips. Then, using the Screw detail for reference, drill mounting holes and glue and screw the trim strips to the subbases (G, H).

5 Center and clamp a subbase to the bottom of each base. Drill angled mounting holes and screw through the bottom of the trim to secure the subbases (E–H) to the bottoms of the side and back panels (A, B). (To do this, we used a 5/32" and 7/64" jobbers-length, 6"-long drill bit as shown in the photo *above*.) Screw the two assemblies together.

The back panel and stretchers come next

1 Cut the back panel (I), bottom band (J), and four stretchers (K) to size.

2 Using the same method used earlier, glue, spline, and clamp the bottom band to the bottom edge of the back panel.

3 Turn both base units upside down on a flat work surface. Position and clamp parts I, J, and K between the base units, and screw (no glue) the pieces in place where shown on the Section View and Exploded View drawings. Use four screws per side to connect each base unit to the back panel (I). The top two Ks function as stretchers, whereas the bottom two form a cord tray for keeping computer cords up and out of the way.

Let's construct the walnut-trimmed laminate desktop

Note: *See plastic-laminates article on* page 56 *for specifics on working with this material.*

1 Cut two pieces of 5/8" particleboard (L), one piece of plastic laminate (we used Formica, hunter green, #967), and one piece of balance sheet to 21×55".

2 Using contact adhesive, adhere the two pieces of particleboard face-to-face with the edges and ends flush. Trim the laminated particleboard to 20×54", keeping all the corners square.

3 Using contact adhesive, adhere the balance sheet to the bottom side of the laminated top. Using a flush trim bit, rout the edges of the balance sheet flush with the edges of the particleboard. Flip the top over, adhere the plastic laminate, and rout its edges flush.

4 To form the cord-access hole, use a Forstner bit and drill a 2 3/8" hole in the desktop where shown on the Desktop drawing.

5 Use 1 3/4" stock (called eight quarter) planed to 1 5/16" thick, or laminate thinner stock, to form the desktop front and back trim pieces (M) and ends (N). Crosscut the stock to 2" longer than listed in the Bill of Materials. Rip and then joint the stock to width.

6 Rout a 1/4" slot 1/2" deep 7/16" from the top edge along the edge of the laminated particleboard top (L) and along the inside edge of the four trim pieces M and N. See the Desktop drawing and accompanying detail for reference.

7 As shown in the detail, rout the outside edge of the four desktop trim pieces. To do this, start with the 2 1/2" classical ogee bit and make three passes, deepening the cut with each pass to prevent chip-out. Then, rout the bottom edge with the 1 1/2" classical bit. (See the Buying Guide for our source of bits.)

8 Rout a slight chamfer along the top outside edge of the laminated top (L) and along the top inside edge of the trim pieces (M, N).

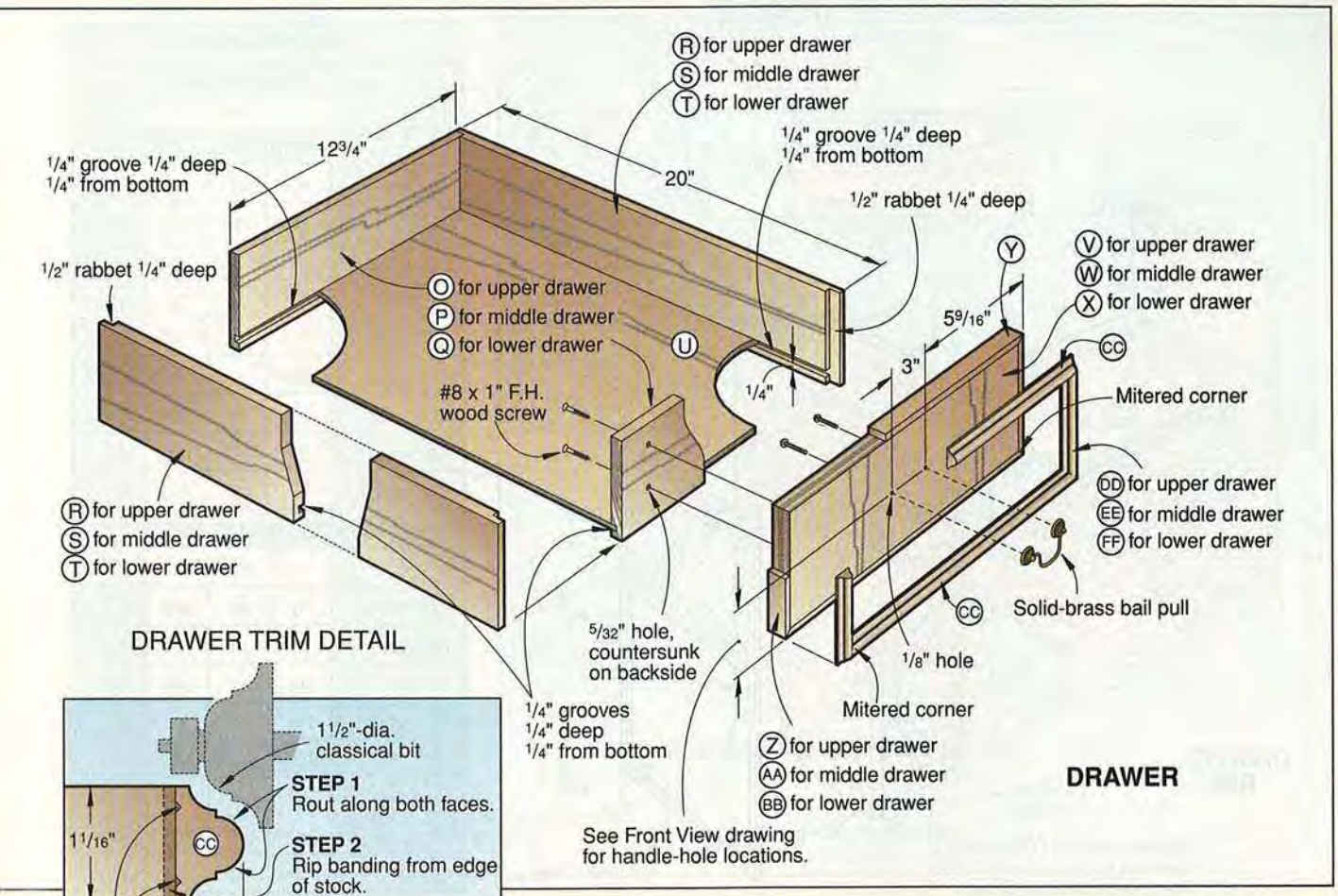
9 Miter-cut the trim pieces to length. Cut the splines, and dry-fit the pieces to ensure a good fit. Glue, spline, and clamp the trim pieces to the laminate top. (We used clamping pads between the clamp jaws and the edges to avoid damaging the routed profile.)

Bill of Materials

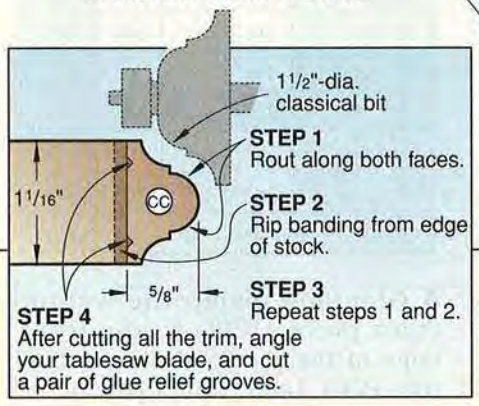
Part	Finished Size T	W	L	Matl.	Qty.
DRAWER BOXES					
O front & back	1/2"	3 1/2"	12 3/4"	W	2
P front & back	1/2"	4 1/2"	12 3/4"	W	2
Q front & back	1/2"	9 3/4"	12 3/4"	W	2
R sides	1/2"	3 1/2"	20"	W	2
S sides	1/2"	4 1/2"	20"	W	2
T sides	1/2"	9 3/4"	20"	W	2
U bottoms	1/4"	12 3/4"	19 1/2"	WP	3
FALSE DRAWER FRONTS					
V front	3/4"	13 5/8"	3 7/8"	WP	1
W front	3/4"	13 5/8"	6 3/4"	WP	1
X front	3/4"	13 5/8"	11 3/4"	WP	1
Y* bands	1/4"	3/4"	14 1/8"	W	8
Z* bands	1/4"	3/4"	4 3/8"	W	2
AA* bands	1/4"	3/4"	7 1/4"	W	2
BB* bands	1/4"	3/4"	12 1/4"	W	2
CC* trim	1 1/16"	5/8"	14 1/8"	W	12
DD* trim	1 1/16"	5/8"	4 3/8"	W	4
EE* trim	1 1/16"	5/8"	7 1/4"	W	4
FF* trim	1 1/16"	5/8"	12 1/4"	W	4

For plenty of storage, let's add the drawers

1 From 1/2"-thick walnut, cut the drawer fronts and backs (O, P, Q) and sides (R, S, T) to the sizes listed in the Bill of Materials. Next, from 1/4" plywood, cut the drawer bottoms (U) to size.



DRAWER TRIM DETAIL



2 Cut or rout ¼" grooves ¼" deep and ¼" from the bottom edge of the ½"-thick fronts, backs, and sides. Next, machine ½" rabbets ¼" deep on the inside surfaces of the drawer sides where shown on the Drawer drawing.

3 For attaching the false fronts (V,W, X) later, drill four mounting holes through each front (O,P,Q).

4 Glue and clamp the three drawers together, checking for square.

5 Cut the false fronts (V, W, X) to size from ¾" walnut plywood. If you experience tear-out when cutting the plywood, make sure the tear-out is on the *face side* where it will be hidden by the trim later. Note the grain direction on the Exploded View drawing.

6 Ripping from the edge of ¾" solid stock, cut 50' of ¼×¾" strips for banding (Y-BB). Now, using the Drawer drawing for reference, band the edges of each plywood false front. You'll use the remaining strips when banding the printer bin and keyboard drawer front later. Sand the banding flush with the front and back surfaces of the false fronts.

7 Following the steps on the Drawer Trim detail, rout and rip 26' of trim from the edge of 1 1/16" stock for trim pieces (CC-FF). Miter-cut two sets of the trim to length, and glue and clamp one set to the front face of the false drawer fronts. Set the other trim set and remaining trim stock aside; you'll add them later to the front of the printer bin and keyboard drawer.

8 In addition to the instructions included with the drawer slides, see the article on *page 93* for our method. After reviewing this information, install the drawers. As noted in the Buying Guide, we used heavier-duty slides on the bottom left-hand drawer and on the printer bin than on the two upper left-hand drawers.

9 Add the false fronts (V, W, X). (We left 1/16" gaps between the drawers. See the Front View on the pattern insert for reference.)

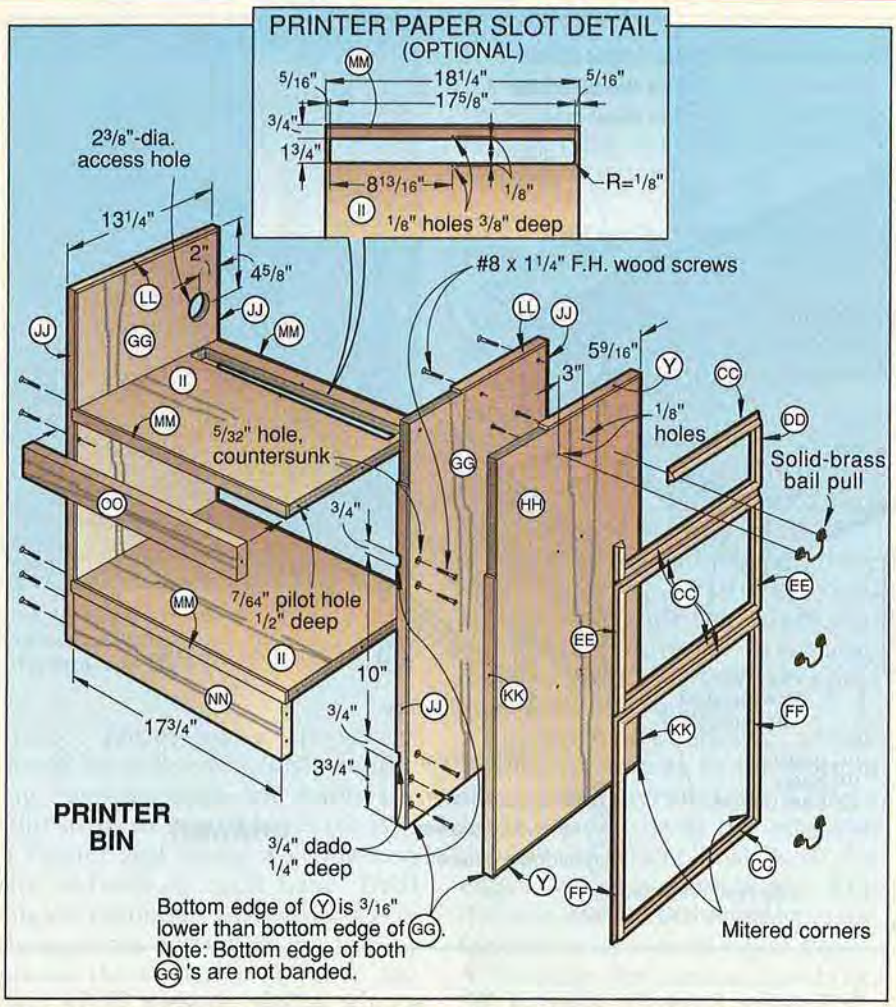
Hide your printer with this pull-out printer bin

1 Cut the plywood panels (GG, HH) and shelves (II) to size. Drill the 2⅜" cord access hole in GG.

2 Using the ¼×¾" banding strips cut earlier, cut pieces (JJ-MM) to length. Band the plywood panels where shown on the Printer Bin drawing. The bottom edges of the front and back plywood panels (GG) are not banded.

Continued

COMPUTER DESK



Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
PRINTER BIN					
GG back	¾"	12¾"	22¾"	WP	2
HH front	¾"	13⅝"	23½"	WP	1
II shelves	¾"	12¾"	18¼"	WP	2
JJ* bands	¼"	¾"	23"	W	4
KK* bands	¼"	¾"	24"	W	2
LL* bands	¼"	¾"	13¼"	W	2
MM*bands	¼"	¾"	18¼"	W	4
NN supports	¾"	3¾"	17¾"	W	2
OO supports	¾"	2"	17¾"	W	2
KEYBOARD DRAWER FRONT					
PP front	¾"	23⅞"	3"	WP	1
QQ band	¼"	¾"	24⅜"	W	2
RR* band	¼"	¾"	3½"	W	2
SS* trim	1 1/16"	⅝"	24⅜"	W	2
TT* trim	1 1/16"	⅝"	3½"	W	2
KEYBOARD DRAWER					
UU sides	½"	2¾"	17"	W	2
VV bottom	¾"	15½"	23"	WP	1
WW front	¾"	1½"	23"	W	1

3 Cut the shelf supports (NN, OO) to size.

4 Cut ¾" dadoes ¼" deep across the inside surface of the front and back panels (GG) where dimensioned on the Printer Bin drawing *above*. Glue and screw the plywood panels (GG, II) and shelf supports (NN, OO) together, checking for square.

5 Miter-cut to length the second set of trim pieces you cut earlier when building the false drawer fronts. Glue and clamp these pieces (CC–FF) to the front of the printer front panel (HH).

6 Attach the drawer slides to the lower shelf supports (NN). Then, attach the mating pieces of hardware to the inside of the right-hand base unit where shown on the Front View drawing on the pattern insert. See the Exploded View drawing for reference.

7 Drill countersunk mounting holes, and screw the false front (HH) to the front of the front panel (GG). Center HH in the opening, side to side and 1/16" from the bottom edge.

Next, let's construct the pull-out keyboard drawer

1 Construct false front (PP–TT) like you did the other false drawer fronts. See the Keyboard Drawer Front drawing for reference.

2 To build the keyboard drawer, cut the sides (UU), bottom (VV), and front (WW) to the sizes listed in the Bill of Materials. Mark and cut the tapered top front edge of the drawer sides to shape.

3 Cut or rout a ⅜" groove ¼" deep ⅜" from the bottom edge on the inside face of each drawer side where shown on the Keyboard Drawer drawing.

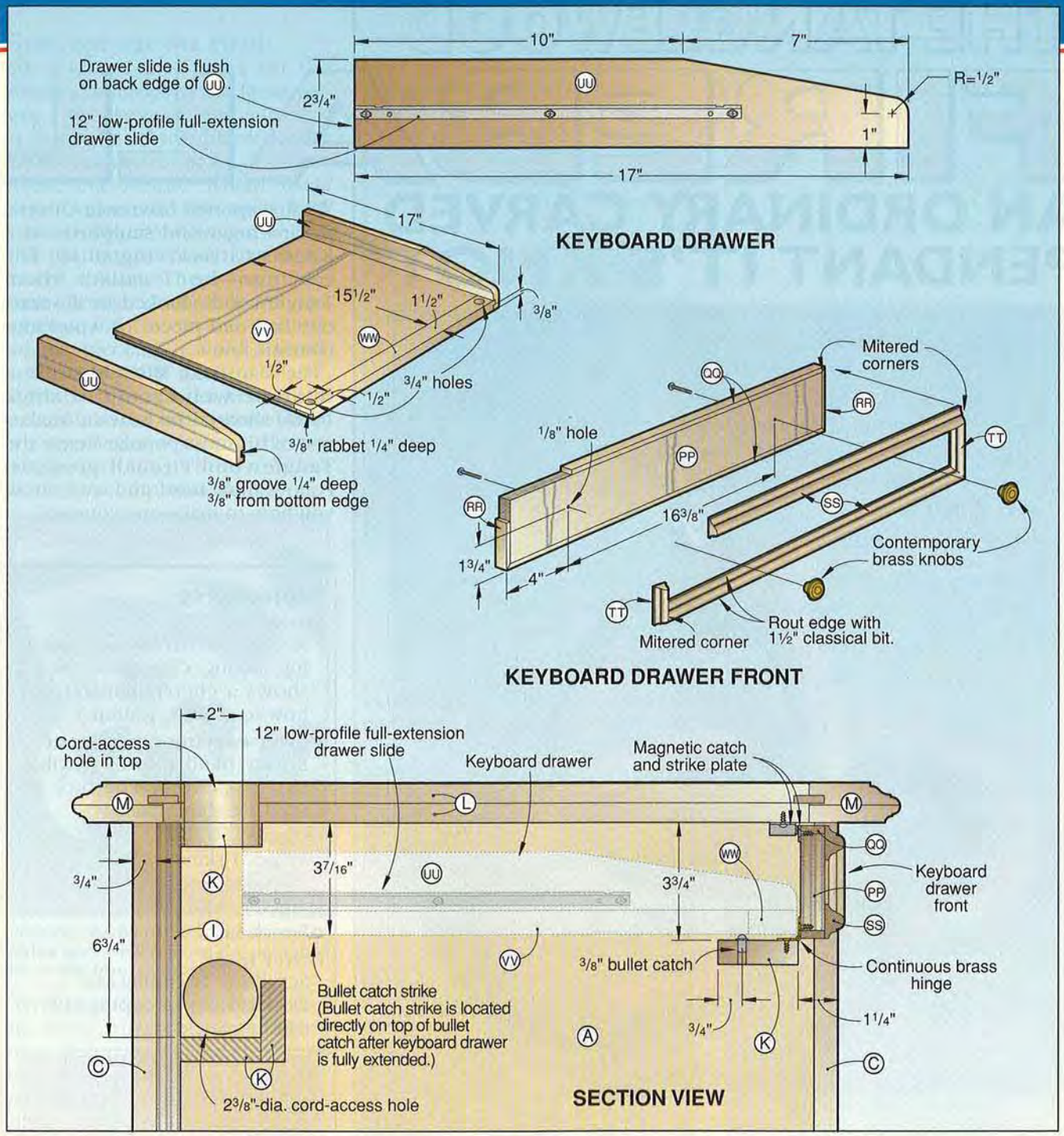
4 Glue and clamp the walnut front piece (WW) to the front edge of the plywood drawer bottom (VV). Later, drill a pair of ¾" holes (finger pulls) near the ends of the front piece where shown on the drawing.

5 Cut or rout a ⅜" rabbet ¼" deep along both edges of the keyboard drawer bottom (VV, WW). Glue and clamp the drawer bottom between the sides (UU).

6 Attach the drawer slides to the drawer and then to the base sides where shown on the Section View and Front View drawings.

Time to install the keyboard drawer

1 Using just three screws, secure a 24" piece of 1½" continuous hinge to the back bottom edge of the keyboard false drawer front (PP). Use three screws to secure the other leaf to the top surface of



the front stretcher (K) where shown on the Section View drawings. Using a minimal number of screws allows you to test-fit the hinge first. Now, drill the holes and drive the rest of the screws.

2 Drill a pair of holes in the front stretcher (K) to fit your ⅜" bullet catches. Mount the mating bullet-catch strikes on the bottom surface of the keyboard drawer.

Add the finish before adding the computer

1 Drill the holes for the pulls on the front of the drawers and printer bin front where located on the Front View drawing. Remove the pulls, and finish-sand all the parts.

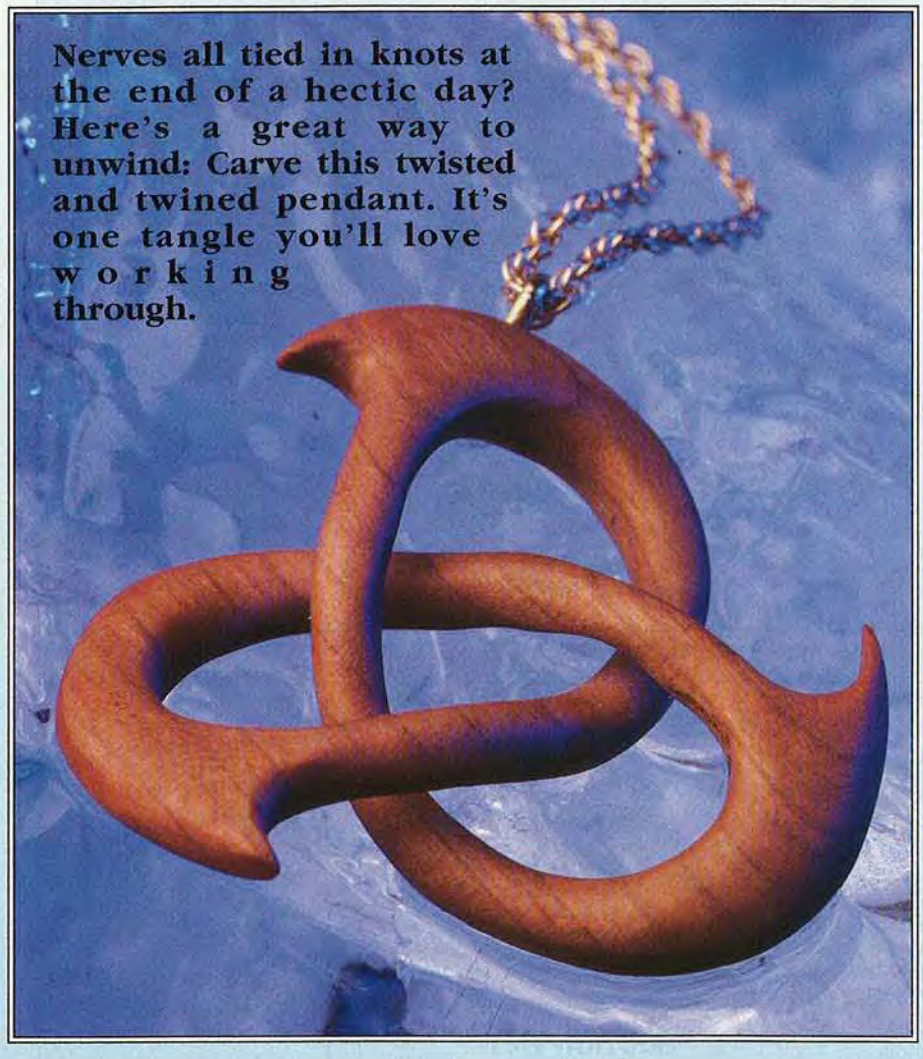
2 For the finish, we used Minwax Walnut Antique Oil followed by two coats of Minwax Special (for dark woods) Finishing Wax.

3 Center the desktop on the base assembly and screw it in place. Reattach the pulls to the drawers and slide them in place. To hold the keyboard drawer shut, add a magnetic catch and strike plate where shown on the Section View drawing *above*. Attach the hardware and install the drawers. Install the cord-access cover and paper grommet.

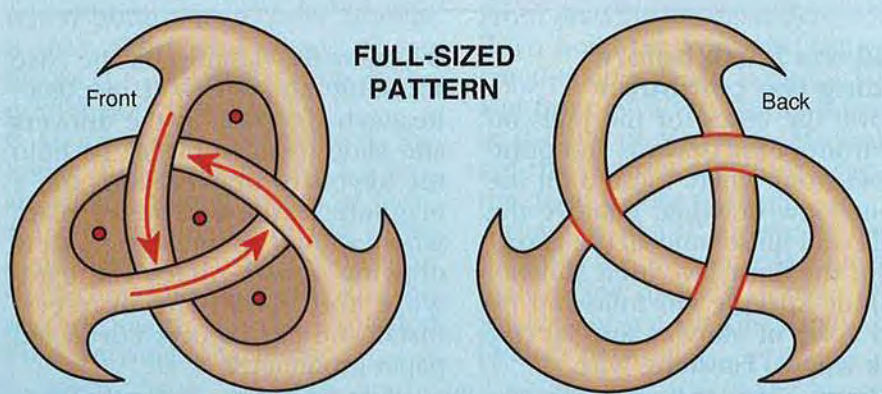
Written by Marlen Kemmet Design: Jim Downing Illustrations: Roxie LeMoine, Kim Downing Photography: King Au

THE TANGLEWOOD FIREBALL

AN ORDINARY CARVED PENDANT IT'S KNOT



Nerves all tied in knots at the end of a hectic day? Here's a great way to unwind: Carve this twisted and twined pendant. It's one tangle you'll love working through.



Print this article

We first spotted Lawrence Oliver's fascinating wood sculptures at a Kansas City carving show. His carvings—he calls them Tanglewood—looked as if someone had tied pieces of wood into fantastic knots.

The Mansfield, Missouri, artist, a full-time wood sculptor since 1980, showed us how he makes one of his most popular items, the Tanglewood Fireball pendant. Follow along now, and we'll show you how to make one yourself.

Project prep

Stock
½×2¼×2¼" hardwood suitable for carving. (The photo *at left* shows a cherry pendant; the how-to photos, walnut.)

Power-carving equipment
Rotary hand tool or flexible-shaft machine. The bits we used are shown *below*.

Gouges
¼" no. 1 skew
5⁄16" no. 5

Knife
Bench knife

Other tools
Scrollsaw or coping saw
Dovetail saw or coping saw
Sanding Stick

We roughed out the pendant with the five bits and small sanding drum shown. Any similar bits would work.

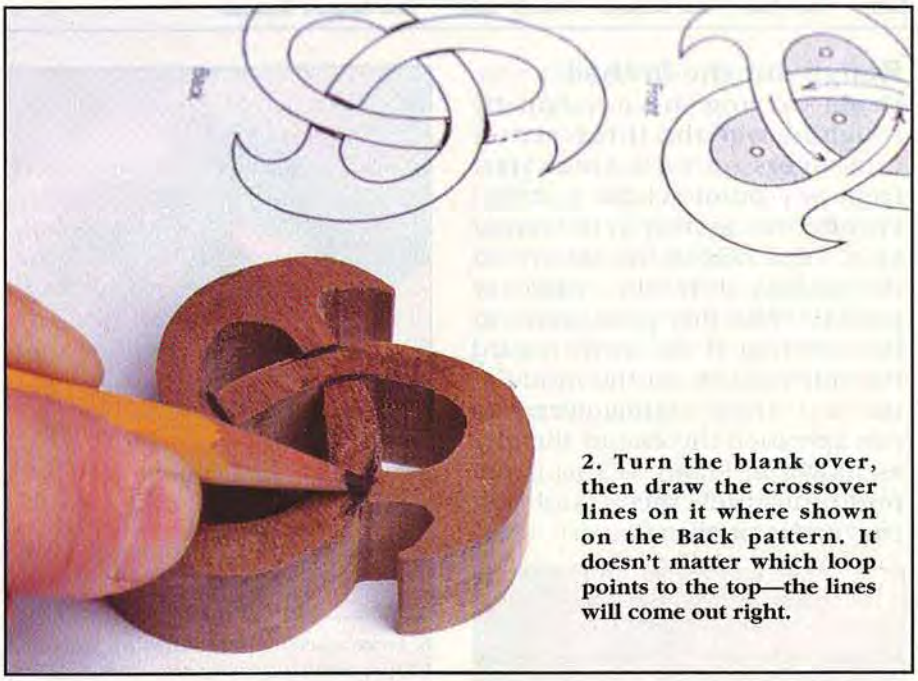
First, cut out the blank

Cut a ½×2¼×2¼" blank for the pendant. Photocopy the Front pattern, *opposite page*, and adhere it to one side of the blank, using rubber cement or spray adhesive.

Next, cut out the shaded inside areas. You can do this easily with a scrollsaw or coping saw. Just drill the four ⅛" blade start holes where shown. Then, insert the blade through the hole in the center area, and cut out the small triangular piece. (We used a scrollsaw fitted with a no. 4 blade, .035×.015" with 16 teeth per inch.) Make the other three interior cuts, then saw around the outside pattern line. Photo 1 *below* shows the completed blank.

1. Cut out the blank with a scrollsaw or coping saw. We'll refer to the patterned side as the front of the pendant.

With the pattern still attached to the front, turn the sawn blank over. Referring to the Back pattern, draw the crossovers (the *red* pattern lines) onto the blank, as shown in Photo 2. To do this with minimum confusion, lay the cutout blank beside the pattern, orienting it with the pattern. (Incidentally, you don't need to worry about which point you place at the top; the lines will be correct regardless of the blank's position.) Then, working around the pattern, draw the lines on the blank. Note that they are opposite to the crossing lines on the front.



2. Turn the blank over, then draw the crossover lines on it where shown on the Back pattern. It doesn't matter which loop points to the top—the lines will come out right.

Draw a centerline around the edge of the blank. Here's an easy way to do it: Measure and mark a midpoint on the edge. Then, place your pencil tip on the marked point and, with your fingertip guiding along the back surface of the blank, draw a line around the edge, as shown in Photo 3 *below*.

3. Your finger makes a great guide for drawing the centerline on the blank.

Stop-cut the crossing lines on both sides. (A *stop cut*, an incision along a pattern line, allows you to carve up to that line without tearing out the wood beyond it.) Stop-cut with a knife or, as shown in Photo 4, a gouge with a curvature—or sweep—that matches the pattern line.

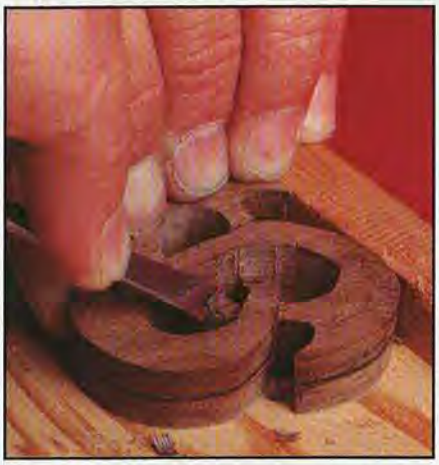
Continued

4. Keep the gouge perpendicular to the surface when stop-cutting.

FIREBALL

Rough out the fireball

Begin carving the pendant by roughing out the three center crossovers on each side. Start from any point where a strand crosses over another in the center knot. (The tails of the arrows on the pattern show the crossover points.) From that point, carve in the direction of the arrow toward the stop-cut line on the inside of the next strand, cutting deeper as you approach the end of the cut, as shown in Photo 5. This is the point at which the strand will pass under another strand.



5. Slope the strands down to ¼" below the original blank surface as you carve the center crossovers.

Maintain the original surface height at the crossover (starting) point. Continue stop-cutting and carving until you've cut about ¼" deep at the end of the cut. Similarly carve the other strands on both sides. Power-carving rotary cutters would work here, but we found this initial carving just as easy to do with a 5/16" no. 5 palm gouge and a ¼" no. 1 skew.

Next, shape the outside loops. For a guideline, draw a pencil line on the outside of each loop, as shown in Photo 6 *above right*. Run the line diagonally from the centerline at the tip, around the outer curve, to the back edge. The line should meet the back edge about ½" before the intersection of the strands, where indicated by the pencil point in the photo. The actual location is not critical, but do keep the points consistent among the three loops.

6. Draw carving guidelines on the outer loops, running from the centerline at the tip to the back surface.

Carve to the line on each of the three loops. A ruby carver or small drum sander chucked in a rotary power-carving tool will do the trick. Or, you can saw away the waste along the guidelines with a coping saw or dovetail saw, then finish the shaping with your gouges. Where an outside strand will pass under another, carve it down to the centerline to meet with the corresponding strand on the inside.

Next, drill the pilot hole for the eye. A 1/16" hole about ⅛" deep centered at the apex of one of the outer loops will suffice.

Separate the strands

Now, it's time to cut the strands apart at the crossovers. A rotary power-carving tool with a spherical diamond bit about 1/16" in diameter performs the task easily, as shown in Photo 7.

Start undercutting from the inside of the knot. Bore into the crossing area, following the slope of the strand. Because the lower strand bends as it passes under the other, don't try to cut all the way through from the inside. Instead, limit your cutting depth to less than half the thickness of the crossing strand.

Then, cut in from the opposite direction (the outside of the knot). Here, you'll cut almost straight into the side of the crossing strand, digging in until you meet up with the cut from the other side. To complete the separation, turn the pendant over and cut in from each side.

Cut the other strands apart, following the same procedure. (The strands will look notched after you cut them apart. You'll be reducing them to about 5/64" diameter later, though, so the notches won't cause a problem.)

7. Undercut the strand crossings using a rotary power-carving tool with a small, spherical cutter. Don't try to cut all the way through from one side.

Now, do some serious sanding

From this roughed-out stage, sand the pendant to its final form. The delicacy of the job calls for hand-sanding, using narrow strips of sandpaper. A narrow sanding tool such as the ¼×6" Sanding Stick comes in handy in a number of spots, too.

Cloth-backed sandpaper works better than paper-backed for shaping the pendant. You'll need a sheet or so each of 100- or 120-grit and 220-grit. (Sanding Stick belts work fine as strips, too.) For finishing, Lawrence uses 320-grit, 400-grit, and 600-grit wet-or-dry sandpaper. (If you can't find the sanding materials locally, they're available from The Sanding Catalog, 800/228-0000.)

Grip one of the pendant's outer loops in a handscrew clamp, as shown in Photo 8. (A swivel-base vise would be a convenient holder, too.) Be careful in clamping the pendant not to crack the wood. Then, tear a strip about ⅛" wide from one edge of the 100- or 120-grit sanding sheet. Thread the strip through the opening nearest the clamp, as shown, and round the strand's edges by drawing the strip back and forth.

When sanding this way, don't go beyond the crossover point. Turn the pendant and reclamp it to sand the rest of the strand—you'll be less likely to break the thin piece of wood. You may find spots that require narrower or wider sanding strips.

On the outside of the strand, you can use the Sanding Stick, as shown. Hold the pendant in your hand, and use a finger to support the back of the piece you're sanding, as shown in Photo 9.

Strive to make the strands a constant diameter (about 5/64" is good). At the same time, work to create graceful curves where the strands cross. Frequently study the pendant's form while you work, referring to the opening photograph. Shape the outer loops and points—a piece of sandpaper wrapped around your fingertip and the Sanding Stick will help accomplish the job.

Once you have shaped the pendant to your satisfaction, smooth the surface with the 220-grit sanding cloth. Then turn to the finer wet-or-dry sandpapers for final smoothing and finishing.

When using the wet-or-dry sandpapers, Lawrence wets them with Danish oil. He uses 1/16 of a sheet for the wet sanding (cut the full sheet into quarters, then cut each quarter into four pieces), folding it and dipping it into the oil. Keep the sandpaper wet as you work. At the same time, you'll be soaking the oil into the wood.

After sanding, wipe the surface with a clean rag. Allow the oil to cure, then carefully buff the pendant. Finally, add a #217½ screw eye and an appropriate chain (you can buy one at the costume-jewelry counter of a department store) to complete the necklace.

8. Clamp the pendant firmly when sanding with a strip. Work carefully, and stay close to the secured end.

9. Support the strand with your finger when shaping with the Sanding Stick.

Project Design: © Lawrence Oliver
Photographs: King Au
Illustrations: Roxanne LeMoine

ART DECO NAPKIN HOLDER

CORIAN SHELLS HIGHLIGHT THIS HANDY ACCESSORY

Print this article

Corian looks like stone and works like hardwood. If you haven't tried it yet, here's a quick-and-easy napkin holder to give you a taste of the latest in craft materials.

1 From ½"-thick Corian (see the Buying Guide for ordering information), rip four 1¼"-wide strips 15" long. Resaw them to the profile shown in the Corian Blank drawing *opposite page*. To do so, tilt your tablesaw's blade 7° from vertical, away from the fence. Raise the tablesaw blade about 1" above the top of the material to prevent chipping. Position the fence ¼" from the blade. (A carbide-tipped blade with about six teeth per inch of diameter works best for Corian.) After cutting, sand the sawn face smooth.

2 Make two photocopies of the six full-sized patterns for the shell segments (A–F) in the *WOOD PATTERNS™* in the middle of the magazine. Adhere the patterns to the bevel-cut faces of the Corian blanks. (Rubber cement or spray adhesive will work.) All 12 patterns will fit on the four blanks if you place one of each size on each blank. Align the short side of the pattern along the narrow edge of the blank. Some of the patterns will not extend to the opposite edge.

3 Using a bandsaw or scrollsaw, cut out the long side and bottom of each segment. (Cut just outside the line so you can sand down to it later, providing a true edge for gluing.) Next, tilt the saw table to 15°. Cut the top of each segment, keeping the workpiece on the high side of the saw table.

4 Sand the segment edges to the line. Refer to the Shell Assembly drawing, and test-fit the segments. Then, glue them together with cyanoacrylate (CA) adhesive. Glue the pieces faceup on a flat piece of particleboard or plywood covered with waxed paper. This will keep the backs of the segments flush.

5 On each shell, sand the bottom edge flush. Next, form a mounting tenon on the bottom of each. To make the tenon with your tablesaw, start by installing a zero-clearance insert in your saw. Set the rip fence ¼" from the blade, and adjust the blade height to ¼". Then, cut the tenon by sliding the back of the shell along the fence, with the shell's bottom edge standing on the saw table.

6 Finish the shells by sanding the front, back, and edges with 220-grit paper, followed by 400-grit paper. Then, buff the surfaces with a gray or white Scotch-Brite pad for a semi-gloss finish.

7 For the base (G), cut a piece of walnut ½×3¾×6". Rout two ¼" grooves 9/32" deep where shown in the Exploded View drawing. (We did this with a table-mounted router and a ¼" straight bit.)

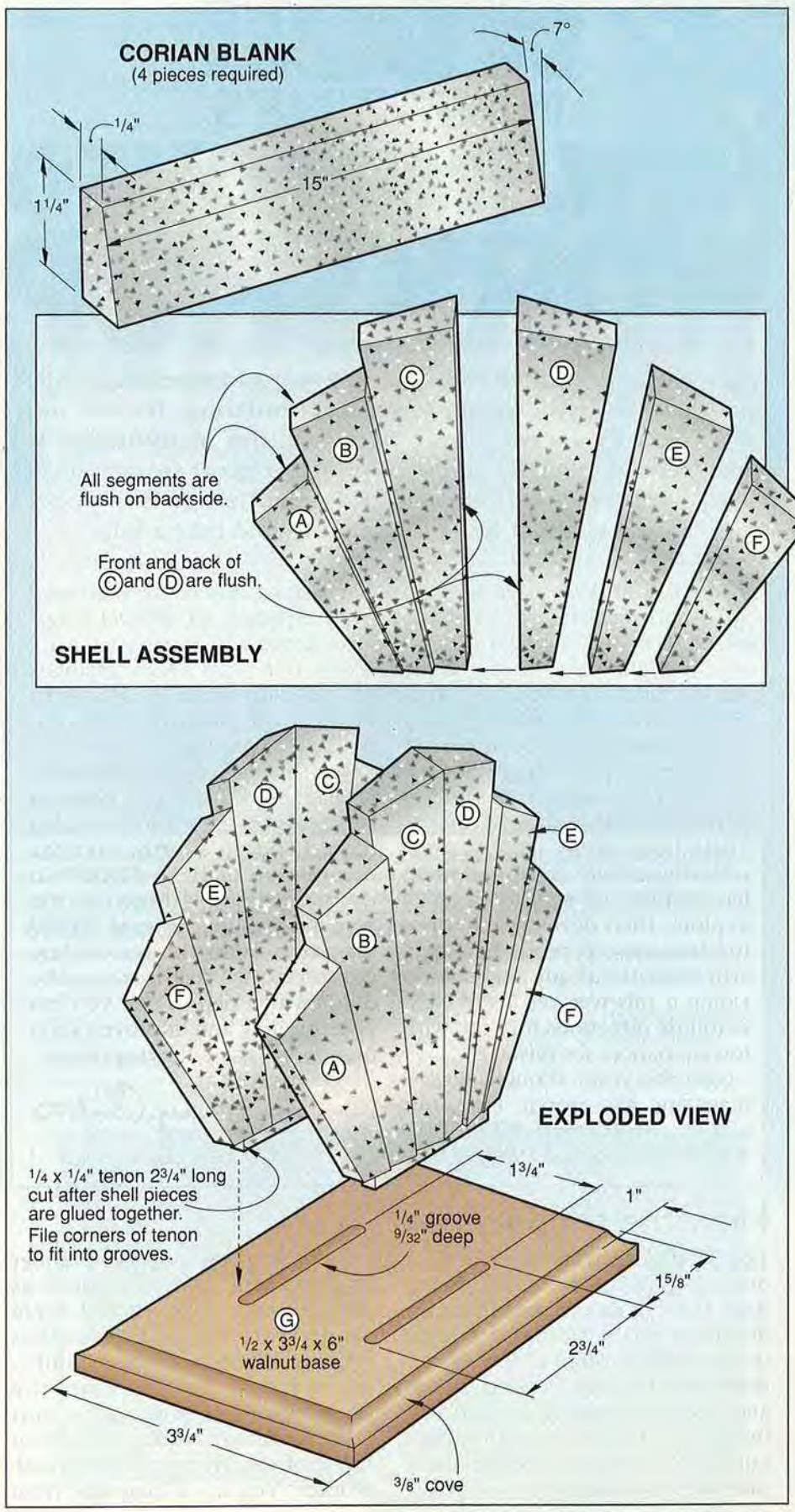
8 Rout a ⅜" cove around the top edge of the base. Sand the base, then apply a clear finish. (Stuff paper into the routed grooves while you apply the finish.)

9 Complete the napkin holder by attaching the shells to the base. File or sand the ends of the tenons to fit into the routed grooves. Then, glue the shells in place with CA adhesive.

Buying Guide

Corian. ½×12×15" sheet, about $33, choice of 10 colors (Sierra Dusk shown), from Leichtung Workshops, 4944 Commerce Parkway, Cleveland, OH 44128. Call 800/321-6840 to order.

Project Design: James R. Downing
Photograph: John Hetherington
Illustrations: Kim Downing; Roxanne LeMoine



GRAND OPENING!

WOOD® MAGAZINE'S NEW, IMPROVED WORKSHOP

After a major remodeling, our 10-year-old workshop once again stands at the ready for project building. It's not only larger, but better than ever, thanks to the many things we have learned over the years. Looking for great storage ideas? How about controlling dust and organizing shop space? You'll find it all right here. Come on in and take a tour!

Before *WOOD* magazine premiered nearly 11 years ago, we made the decision to build every project slated for its pages in an on-site shop. That means that from Day One a project builder has been part of the magazine staff. And he's always had a shop to work in right next to the editorial offices. That's been swell.

Having a fully equipped shop has enabled our staff to carefully explore, then develop and write the step-by-step project-building articles without any guesswork. Doing it this way results in easy-to-follow directions for you, with fewer chances for mistakes.

Over the years, though, *WOOD* magazine has grown. First, our sister publication *WEEKEND WOODWORKING PROJECTS®* came along. Then, we increased the frequency of *WOOD* magazine from six issues to nine issues per year. Those changes resulted in more projects to build and another project builder to help build them.

So that our shop could accommodate two project builders at once, we began our long-needed redo. It began shortly after the completion of IDEA SHOP™ 2, the garage shop shown in the September 1994 issue of *WOOD* magazine. With the remodeling complete, we're throwing the doors wide open so that you can visit our new and improved shop on this and the following pages.

Larry Clayton

Larry Clayton, Editor

How the shop lays out

The *WOOD* magazine workshop occupies a 47×23½' space on the third floor of an office building in downtown Des Moines. Its location makes for quite a view of the river and the park beyond, but it also meant planning around the necessary freight elevator that cuts into the room (see the floor plan on *opposite page*).

Because of the possible number of concurrent activities—such as producing a shop-tested technique story on routing dadoes while projects are being built—going on at any one time, the shop required tool and layout considerations different from those of the average home woodworker. Yet, it's a long way from being a commercial production shop because we use tools typical of those that our readers have or can afford.

From IDEA SHOP™ 2, we learned the value of mobility. That's why we mobilized the power tools and work centers along the window wall (at top in the drawing *right*). The bandsaw,

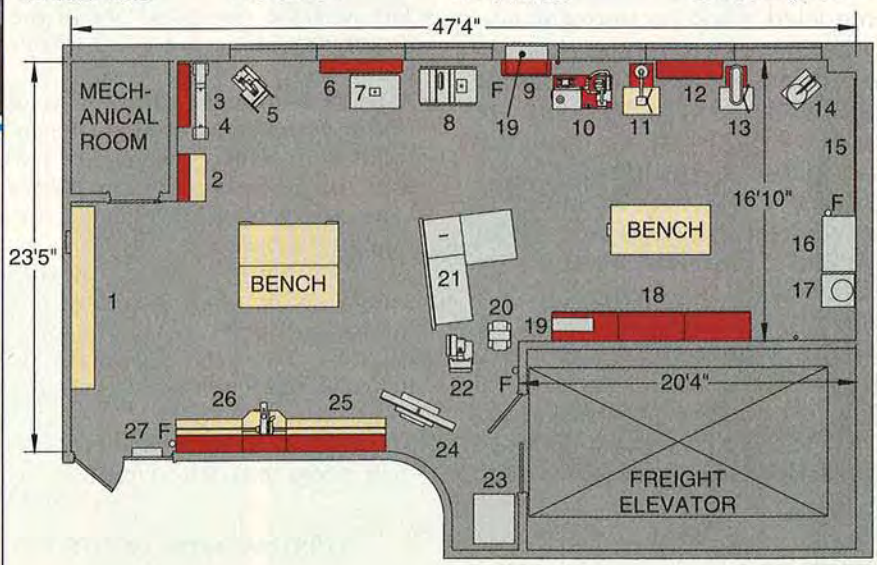
Print this article

Chuck Hedlund, *WOOD* magazine's project builder, clamps an assembly together at one of the workbenches. This view looks north from the double entry doors. At right you can see the ducts and blast gates of the central dust-collection system.

WOOD® MAGAZINE SHOP LAYOUT

1. Lumber storage
2. Drawing table
3. Lathe-tool cabinet
4. Lathe
5. Bandsaw
6. Router-bit cabinet
7. Router table
8. Tablesaw
9. Sandpaper cabinet
10. Sanding center
11. Drill press
12. Drill-bit cabinet
13. Benchtop drill press
14. Scrollsaw
15. Clamp-storage wall
16. Paint storage
17. Paint booth
18. Tool cabinets
19. Air-filtration unit (2)
20. Planer
21. Tablesaw
22. Belt/disc sander
23. Dust collector
24. Jointer
25. Hand-tool cabinets
26. Radial-arm saw
27. First-aid center

F. Fire extinguisher



tablesaws, and large drill press sit on mobile bases. The shop-built router table, sanding center, and small drill-press cabinet feature casters. Depending on the space requirements of the task at hand, each of these machines and work centers easily relocate.

We placed the tablesaw with the 52" extension table, the thickness

Continued

planer, the 8" jointer, and the belt/disc sander in the center of the shop (although each machine also has a mobile base). This central position provides plenty of room for ripping sheet goods and machining stock. A workbench at each end of the shop makes it possible for two project builders to work on different projects at the same time.

The radial-arm sawing center occupies the shop's short wall (between the elevator and the entrance doors). It's surrounded by cabinetry that houses pertinent accessories and hand tools as well as the shop's safety equipment (see photo *opposite page*).

At the opposite end wall from the clamp-storage rack (see photo on *page* 80), there's a space for lumber and sheet goods storage. That end of the shop also accommodates a planning area and turning center (as shown *page* 79).

The shop also features an industrial dust-collection system that serves the central machines, the tablesaw and router table along the wall, and the radial-arm saw. The bandsaw and the sanding center rely on shop vacuums in their cabinet bases. Two particulate filters at different locations catch fine, air-borne dust. Most finishing is done in a seperate room.

Why we chose the machines you see

We based our tool choices for the remodeled shop on performance-test ratings and favorable features that stem from *WOOD*® magazine tool-comparison articles. Here are the new woodworking machines that project builders Chuck Hedlund and Jan Svec selected, and why. (See the box *page 80* for tool and equipment manufacturers and model numbers.)

After trying nearly all of the 12" portable planers on the market, the vote went to the Hitachi P12R. "Although it was one of the more expensive ones," says Chuck Hedlund, "it produced the least amount of snipe. The Hitachi also cuts at a much faster rpm than the others. Combine that with its slower feed rate, and a bed that's at least twice as long as the others, and you get smooth planing. Too, it came with carbide-tipped knives and we ordered an extra set."

To complement the shop's existing Delta Unisaw with its shop-built router table, Chuck and Jan chose a Powermatic 66 tablesaw. They fitted it with a Biesemeyer fence, known for its accuracy and rugged simplicity. Chuck likes the Powermatic because the blade tilts to the left, away from the fence. "It won't catch pieces of cut-off stock," he explains. The saw has an optional table to the right of the fence that allows the sawing of a 50" panel, as well as 37"-wide outfeed rollers, table support panel, and lower shelf board from HTC.

Our project builders also prefer Sears' latest Craftsman radial-arm saw. "Its user-friendly guard lifts out of the way only when you squeeze its lever," Jan notes.

To true the face side of a board—even a cupped one—before it's planed, the building team selected a Grizzly jointer with an 8"-wide bed. "This model has a longer bed for edge-jointing," Chuck comments.

In addition, our project builders chose the following:

- The Jet lathe was rated one of the better models under $700 in our tool tests.
- A Delta 14"-throat bandsaw won out in comparison testing. We fitted it with self-contained dust collection by installing a Sears Craftsman Model 17758 shop vacuum in the base.
- The Clayton oscillating spindle sander at the sanding station is a heavy-duty performer. The base cabinet on which it and the 1" belt/disc sander sit also received a shop vacuum.
- The Sears Craftsman 34" benchtop drill press was fitted with a DC

Continued

The central dust-collection system serves the planer, tablesaw, and stationary belt/disc sander. For the radial-arm saw on the shop's east wall, we constructed a 12'-long cutoff table with base cabinet. Cabinets above hold accessories and safety equipment.

The sanding center features an oscillating spindle sander and a benchtop belt/disc sander. The storage cabinet below contains a portable shop vacuum to power the work station's self-contained dust-collection system.

A fold-down tabletop and a cork bulletin board with a storage cabinet above serve as the shop's planning center. Note that the adjacent lathe and the bandsaw—like most machines in the shop—have mobile bases.

motor and dial speed control. That's an expensive accessory, but it fills the bill in our shop for bit testing. The big Grizzly drill press parked down the line was selected because it offers slow speed settings combined with power for large boring jobs.

- To maximize available space, nearly all the stationary tools sit on HTC mobile bases
- And, although actually safety implements, not tools, we added two Penn State Industries two-speed air-cleaning units that operate at 460 or 920 cfm. With one on either side of the shop, they keep the air circulating as it's filtered.

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Jointer:
Grizzly model G1018
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A 12'-long bank of 8'-high cabinets provide storage for portable-power tools, saws, and other equipment in the top tier. The lower units have bins for hardware and fasteners. All shelving is adjustable.

The 8×8' clamp rack on the north wall handily groups similar style clamps with the help of shop-built, maple hanging fixtures that were described in *WOOD* magazine's first IDEA SHOP™.

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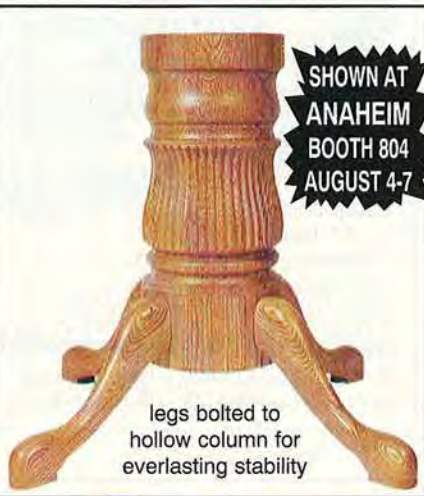

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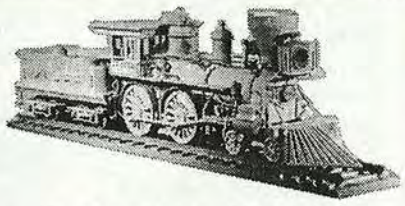

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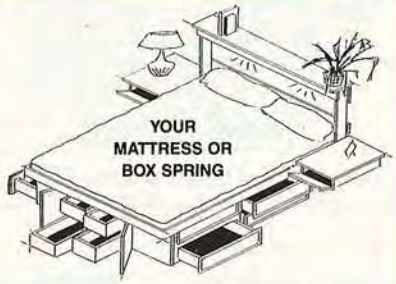

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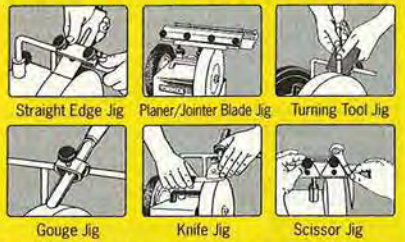

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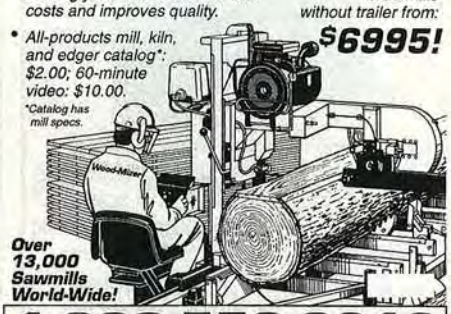

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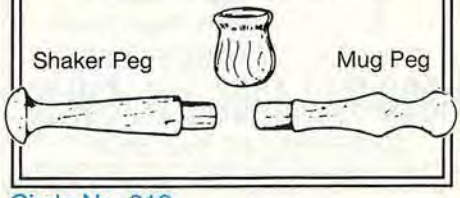

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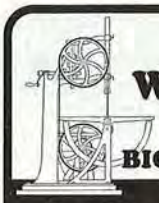

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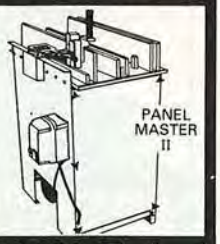

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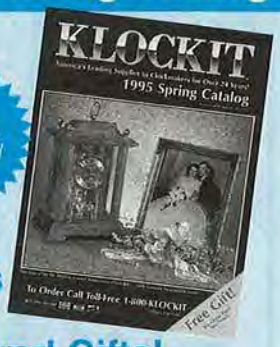

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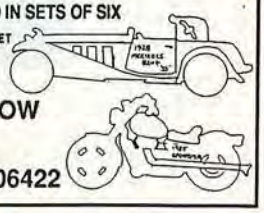

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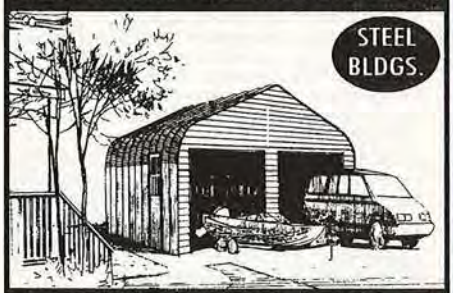

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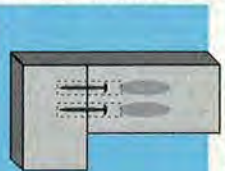

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INSTALLING SIDE-MOUNT DRAWER SLIDES

What woodworkers need to know

No matter how flawlessly you construct a piece of furniture, or how beautifully you finish it, if it has drawers, people often judge the workmanship by how smoothly those drawers open and close. To guarantee easy-gliding drawers with minimum fuss, you can't beat side-mount, full-extension drawer slides.

Selecting slides

For convenience and load capacity, *WOOD®* magazine's project builder, Chuck Hedlund, likes full-extension slides that mount on the sides of the drawer. "The usual three-quarter extension slides make it hard to get things into and out of the back of the drawer," Chuck notes. "Full-extension ones just make a piece of furniture more functional." Bottom-mount slides, such as the kitchen-drawer type, may open nearly as far as full-extension guides, but don't operate as smoothly and usually aren't built to handle heavy loads.

All slides carry load ratings, so pick a set with a carrying capacity that exceeds the weight of the drawer and its intended load. Be generous when estimating the load you'll be putting on the slides. For desk drawers and others of similar size, Chuck picks slides rated to carry 75 pounds. Deeper drawers get 150-pound file-drawer slides to ensure adequate load capacity.

Install the slides carefully

"Drawer slides must be square to the cabinet and parallel to each other," Chuck points out. If they aren't square, the drawer may twist and bind. If slides for stacked drawers aren't parallel, the drawers may collide with each other when they're opened. And, of course, slides that slope toward the front cause drawers to open of their own accord, leading to rumors of haunted furniture.

To ensure smooth-sliding drawers, Chuck has developed a procedure for installing slides. Working with the basic drawer—without the drawer face attached—he follows these steps to make a potentially complicated job simple:

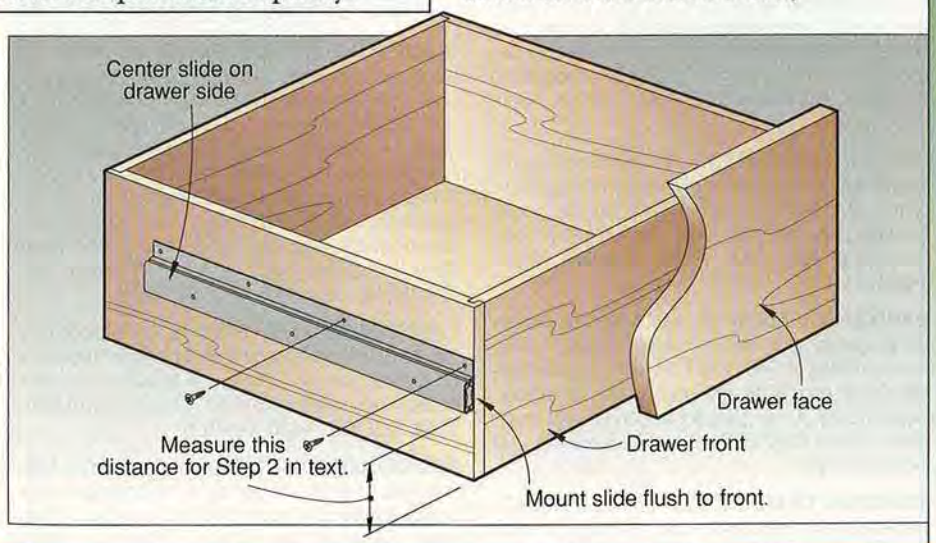
1 Attach the slides to the drawer sides. Center a complete slide assembly on each side, parallel to the bottom edge, shown in the illustration *below*. Fit the front of the slide right up to the drawer's front edge. (Be sure to put handed slides on the correct sides.)

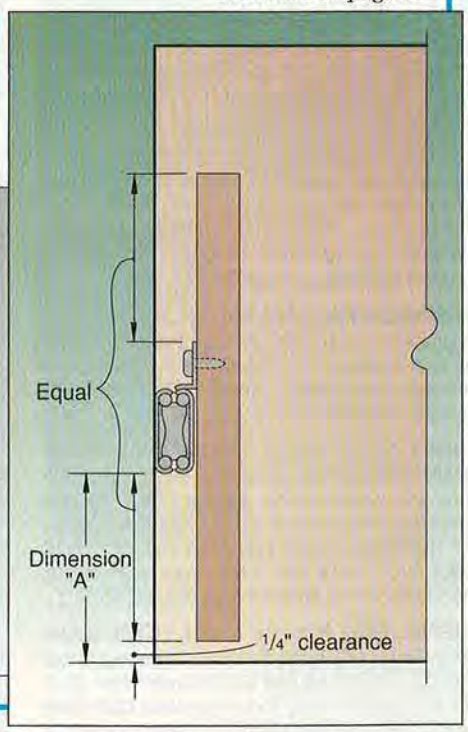
2 Measure from the bottom of the slide assembly to the bottom of the drawer where shown, then add ¼" to the measurement. The resulting dimension, which we'll call Dimension A, will be the distance between the bottom of the drawer opening and the bottom of the slide assembly (see the detail drawing *below*). The additional ¼" provides fitting and operating clearance.

3 Separate the cabinet-mount part of the slide assembly from the drawer-mounted part. Mark which side of the drawer they mate to so you can install them on the correct side in the cabinet.

4 Install the slides inside the cabinet. A scrapwood locating fixture such as the one shown in the illus-

Continued on page 95





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What woodworkers need to know

INSTALLING SIDE-MOUNT DRAWER SLIDES

Continued from page 93

tration *below* will help position them accurately. Cut the stock for the fixture (¼" plywood or hardboard works fine) to fit inside the carcase. To determine the fixture's height, measure from the bottom of the cabinet to the bottom of the drawer opening. (With stacked drawers, measure to the bottom of the top drawer opening.) Add Dimension A to that measurement, and use the sum for the fixture height.

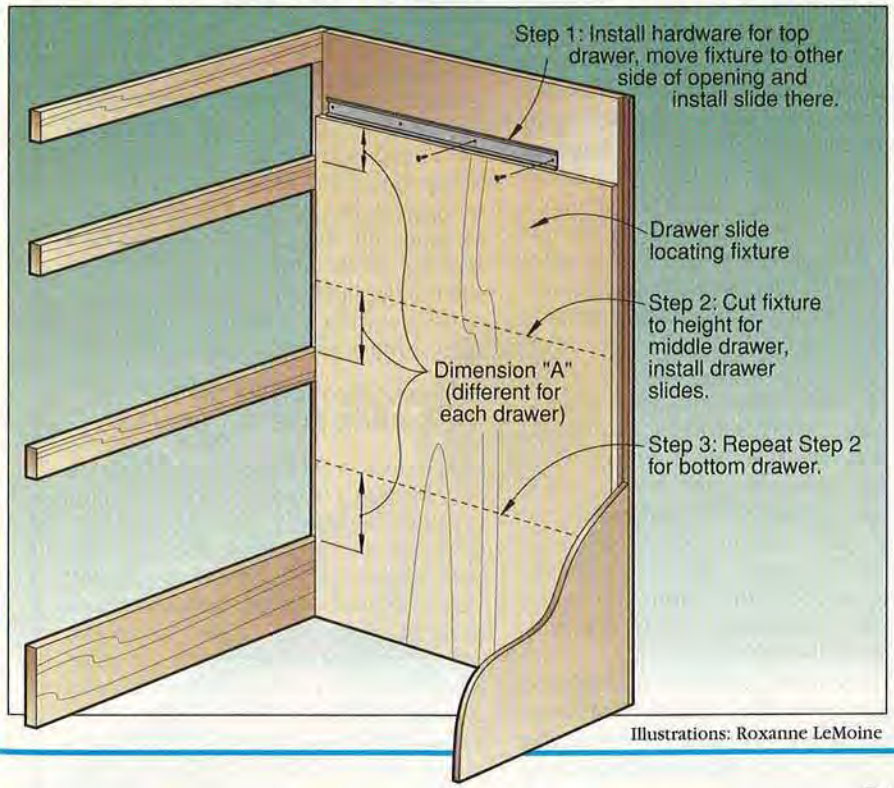
(The illustration shows a three-drawer cabinet; you can apply the same principle to projects with any number of drawers.)

5 Rest the slide on the top edge of the fixture as shown in the illustration, and attach it to the inside of the carcase. You must consider the drawer face when you mount the hardware in the carcase. If the face overlaps the front of the carcase, mount the drawer slide so the drawer front closes flush with the carcase front. If the face fits inside the drawer opening, flush with the front of the carcase, set the front of the drawer back from the front of the opening by a distance equal to the thickness of the face.

6 Move the locating fixture to the other side of the drawer opening, and install the slide for the other side of the drawer. Keep the same edge of the fixture toward the front to ensure parallel slides.

7 Place the drawer on the slides, and check its operation. Attach the face to the drawer box.

8 For multiple-drawer installations, determine the fixture height for the next drawer down, using the procedure in Step 4. Cut the fixture to the new height, and install the slides as above.


Step 1: Install hardware for top drawer, move fixture to other side of opening and install slide there.
Drawer slide locating fixture
Step 2: Cut fixture to height for middle drawer, install drawer slides.
Dimension "A" (different for each drawer)
Step 3: Repeat Step 2 for bottom drawer.

Illustrations: Roxanne LeMoine

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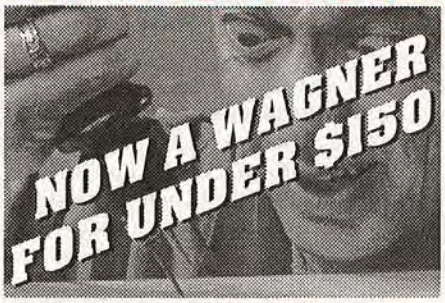

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New Technology Improves Sleep Quality

Chances are, you need better sleep. Thanks to advances in sleep surface technology, now you can get it!

America has become a nation of the chronically sleep-deprived. The Better Sleep Council reports that over the past 20 years, we Americans have added around 158 hours, or nearly an entire month each year, to our job schedules. That's not to mention the time we spend working hard to care for our families and homes. Sleep deprivation is caused by both lack of time spent sleeping and poor quality sleep. Sound familiar? Then you owe it to yourself to read on!

SLEEP DEPRIVATION CAN BE DANGEROUS

According to the AAA Foundation for Traffic Safety, falling asleep at the wheel is second only to alcohol consumption as a cause of automobile accidents, claiming as many as 6,500 lives every year. Disrupted sleep and sleep disorders cost American businesses billions of dollars annually in lost productivity, industrial accidents and higher medical bills. Lack of sleep also was implicated in the Exxon Valdez oil spill, the space shuttle Challenger disaster and the nuclear accident at Three Mile Island.

Loss of sleep during the night is responsible for increased vulnerability to illness, a tendency to nod off at work the next day, and even loss of creativity and clarity of thinking, say British researchers. Power tools can become dangerous weapons in the hands of someone who is not well rested. And almost everyone is familiar with the physical aches and pains that occur because of poor quality sleep.

DO YOU NEED MORE SLEEP, OR JUST BETTER SLEEP?

On the average, most adults require seven and a half to eight hours of sleep per night, and a full cycle including *deep* sleep is required for us to feel adequately rested in the morning. Any number of factors can interfere with deep, nourishing sleep–including cigarette smoking, worry, a noisy environment and physical discomfort.

Only air-cushioned support has been proven to positively affect all three factors that determine the quality of sleep: spinal alignment, pressure points and physiology.

We try remedies from pain medication and sleeping pills, to chiropractic care and self-relaxation techniques in order to get better sleep and rid ourselves of morning aches and pains. But new sleep surface technology offers a simpler solution for many people who toss and turn.

THE FIRST REAL BREAKTHROUGH IN SLEEP SURFACE TECHNOLOGY IN OVER 100 YEARS

Even if you just bought a new bed, you may be sleeping on an antiquated surface! Developed a century ago, innerspring mattresses create pressure points that interfere with total relaxation. Waterbeds made a big splash in the '60s, but even those labeled "firm" produce a hammock effect, causing the spine to curve unnaturally. Fortunately, a new technology has come through test after test with flying colors: Select Comfort Air Sleep Systems™.

The Select Comfort adjustable firmness mattress uses air, which, unlike metal coils or water, distributes body weight more evenly and provides better support.

While it looks like a traditional mattress on the outside and even fits standard sheet sizes, the Select Comfort mattress is completely unique on the inside. Air is captured inside innovative "I-beam" chambers that contour to the body, support the spine, eliminate pressure points and evenly distribute weight for better sleep.

What's more, each side of the Select Comfort adjustable firmness mattress is independently adjustable–with a remote hand control that digitally tells you the firmness level that's perfect for you. And, you can let air in or out to change the mattress firmness, depending upon how your body feels each night. This is essential for couples, because two people of different shapes and sizes cannot sleep on the same surface and both be as comfortable as they should be to achieve the best possible sleep.

MADE-IN-MINNESOTA QUALITY

Select Comfort adjustable firmness mattresses are manufactured in Minneapolis, Minnesota, and tested for comfort and durability by independent laboratories. Well on its way to becoming a worldwide leader in state-of-the-art sleep systems, Select Comfort currently is the fastest growing company in America's bedding industry, and has earned 22 U.S. patents.

LIGHTWEIGHT AND EASY TO SET UP YOURSELF

The Select Comfort adjustable firmness mattress is so lightweight, it can be delivered via UPS in one carton. Following the simple instructions, one person can set up the system at home, usually in 30 minutes or less. An attached electronic air pump fills the mattress with the right amount of air, and then hides out of sight under the bed. Dual controls allow each sleeping partner to adjust the sleep surface to their desired firmness.

TRY SELECT COMFORT RISK FREE FOR 90 NIGHTS

Thousands of people from coast to coast already own a Select Comfort adjustable firmness mattress. You can try one, too, protected by a "90 Night No Risk" guarantee and a 20-year product warranty. Call our sleep consultants and ask them about your particular sleep needs. They can answer all your questions and help you better understand how you can benefit from a Select Comfort adjustable firmness mattress.

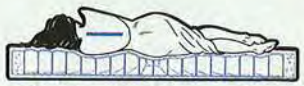
For a free brochure and introductory video, call 1-800-831-1211, Dept. 4209.

Relieve Back Pain!

Frustrated With The Quality Of Your Sleep?

Do you toss and turn at night? Can't seem to find a comfortable position? Does your back ache when you awake? These are signs that your metal coil mattress or waterbed isn't supporting you properly and isn't right for your body. Select Comfort can help you sleep better with a revolutionary mattress that's so comfortable and supportive, it's recommended by doctors.

With Select Comfort, you each get exactly the firmness you need.

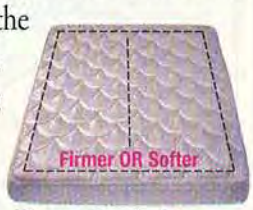


Select Comfort's patented air cushion design has no springs or coils that can create pressure points and uneven support.

Metal coil mattresses support only the firm parts of your body, creating pressure points, and uneven spinal support.

You Control The Firmness

With Select Comfort, you can change the firmness depending on how your body feels each night. Go from extra-firm to extra-soft, simply at the touch of a button. In fact, the firmness adjusts independently on each side of the bed so you and your partner can get custom support without compromising comfort or quality of sleep.



Customize the firmness of each side of the mattress.

Sleep Better On Air

A Select Comfort adjustable firmness mattress doesn't rely on springs or water. Instead, it supports your body perfectly on a cushion of air. Air is better because it gently contours to your body's shape and keeps your spine in its natural alignment. And that lowers the tension in the surrounding muscles. So you can sleep comfortably in any position and wake feeling great–without back pain.

Select Comfort contours to your body.

The Only Mattress with Push Button Firmness Control.

Call For More Information

You owe it to yourself to learn more about this revolutionary way to a better night's sleep.

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GREAT GOBLETS GALORE

Continued from page 51

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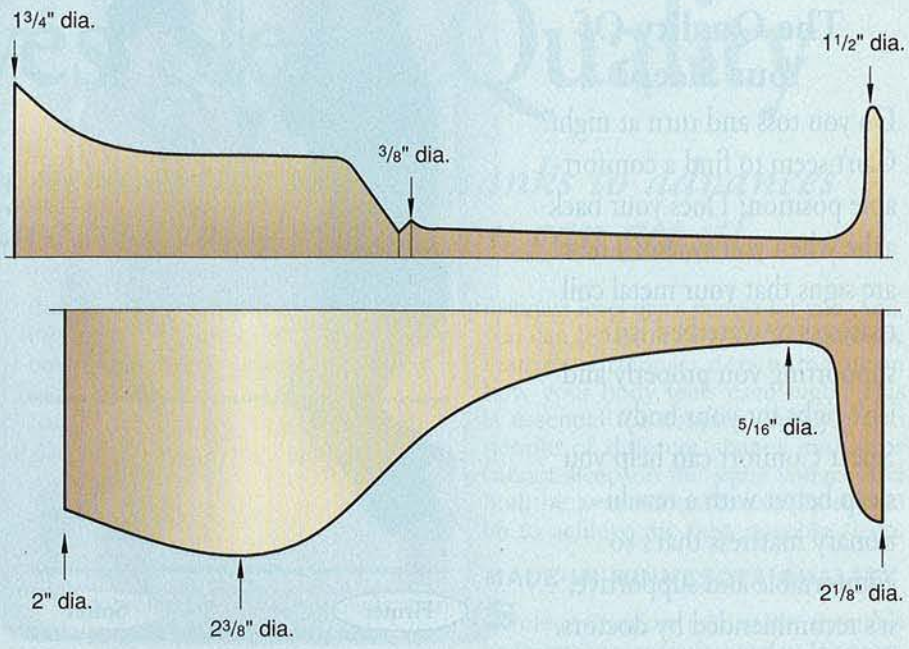

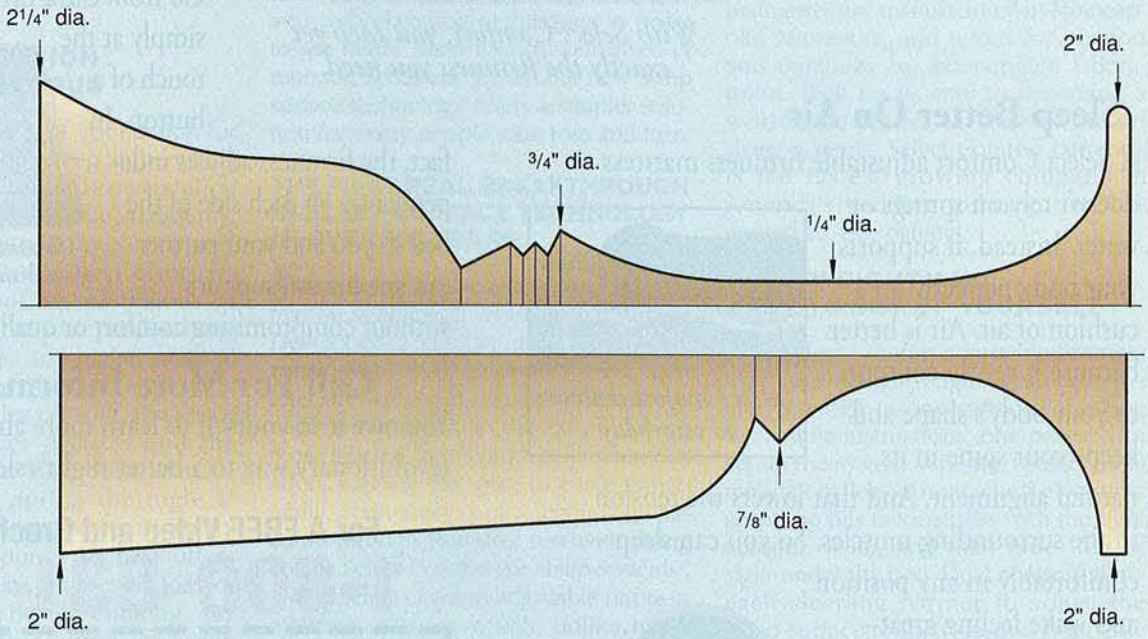

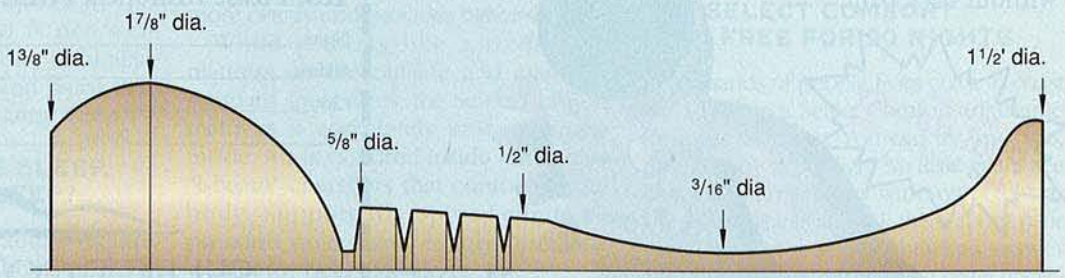

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6749-1	Drywall Gun 0-2500 5.4 amp	218	128
6365	7-1/4" Circular Saw 13 amp	218	122
6366	6365 w/fence & carbide blade	228	129
6368	6365 w/fence,carb. blde,& cse	249	139
6377	7-1/4" Worm Drive Saw	330	189
6256	Top Handle Jig Saw	264	152
6490	10" Mitre Saw	444	255
6491	6490 w/ carbide blade & bag	532	275
6494	NEW 10" Compound Mitre Saw	444	315

QUICK DRIVE KITS

SG-2000	Subfloor/drywall, drives screws 1" - 2", complete kit incl. extension	765	485
SG-3000	Deck/subfloor, drives screws 2" - 3", complete kit incl. extension	936	595

FREUD CARBIDE TIPPED SAW BLADES
5/8" Bore - Industrial Grade

Item	Description	Teeth	List	Sale
LU72M010	Gen Pur. A.T.B.	10" 40	69	39
LU82M010	Cut-off 10"	60	93	45
LU84M011	Comb 10"	50	78	42
LU85M010	Super Cut-off	10" 80	115	59
LM72M010	Ripping 10"	24	69	38
LU73M010	Cut off 10"	60	84	45
LU87M010	Thin Kerf 10"	24	72	39
LU88M010	Thin Kerf 10"	60	88	45
LU98M010	Ultimate 10"	80	128	68
LU91M010	Compnd Mitre 10"	60	88	54
F410	NEW Quiet Blade 10"	40	95	49
F810	NEW Quiet Blade 10"	80	135	74
TK303	7-1/4" Finishing	40	38	22
TK906	10" Combo	50	53	32
SD308	8" Dado - Carbide		230	119
SD506	6" carbide w/case & shims		292	155
SD508	8" carbide w/case & shims		344	168
F0	1-3/4" x 5/8" Biscuit 1000 Qty		43	29
F10	2-1/8" x 3/4" Biscuit 1000 Qty		43	29
F20	2-3/4" x 1" Biscuit 1000 Qty		45	29
FA	Assorted Biscuits 1000 Qty		45	29
FB100	16 piece Forstner Bit Set		338	189
94-100	5 pc. Router Bit Door System		320	159
TR215	10" Slide Cmpd Mitre Saw		688	369
JS102	Biscuit Jointer w/adj fnc&cs		355	179
FT2000E	3-1/4 HP v/sp Plunge Router		410	205
	FT2000E comes with FREE FT2010 Guide			
JS100	Biscuit Jointer & biscuits		334	164

MAKITA TOOLS

Model	Description	List	Sale
6070DW	3/8" v/spd Reverse Drill 7.2V	128	64
6172DWE	3/8" v/spd Drill Kit w/ 2 batt	220	109
5090DW	3-3/8" Saw Kit 9.6 volt	270	145
ML900	Incandescent Flashlight 9.6V	Sale	37
DA391DW	3/8" angle Drill Kit 9.6 volt	312	179
6012HDWE	2 speed Drill Kit w/2 batt.	243	135
6093DWE	6093DW Drill Kit w/2 batteries	270	139
6095DWE	6095DW Drill Kit w/2 batteries	270	139
6095D	6095DW Drill only & case	Special	79
6201DWE	9.6V Drill Kit w/2 batt.	298	155
6211DWE	12V Drill Kit with 2 batteries	330	169
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28
5007NBA	7-1/4" Saw w/electric brake	263	135
5008NBA	8-1/4" Saw w/electric brake	346	195
9900B	3" x 21" Belt Sander w/bag	344	175
9924DB	3" x 24" Belt Sander w/bag	329	184
4301BV	Orb. var. spd Jig Saw 3.5A	292	158
JR3000V	var. speed Recip Saw w/case	252	135
9820-2	Blade Sharpener	394	209
N1900B	3-1/4" Planer with case	244	129
N9514B	4" Disc Grinder 4.6 amp	111	65
B04550	1/4 sheet Pad Sander w/bag	98	52
DA3000R	3/8" Angle Drill	314	179
2708W	8-1/4" Table Saw	585	298
2711	10" Table Saw with brake	1067	569
6404	3/8" Drill Rev. 0-2100 rpm	112	65
6510LVR	3/8" Drill Rev. 0-1050 rpm	168	98
6013BR	1/2" Drill Rev. 6 amp	280	149
9401	4" x 24" Belt Sander w/bag	378	229
4302C	var. speed Orbital Jig Saw	351	199
5077B	7-1/4" Hypoid Saw	281	155
5007NB	7-1/4" Circular Saw 13 amp	232	124
5007NBK	5007NB Saw w/ plastic case	Sale	129
LS1011	**10" Slide Compound Saw**	946	525
LS1211	New 12" Slide Cmpd Saw	1550	865

SENCO AIR NAILERS

SFN1	Finishing Nailer 1" - 2"	448	309
SN325	Nailer 1-7/8" - 3-1/4"	665	419
SLP20	New Pinner w/cse 5/8 -1 -5/8"	399	278
SKS	Stapler 5/8" - 1-1/2"	390	275
SN70	Fram. Nailer Clip Hd 2"-3-1/2"	690	479
SN60	Fram. Nailer-Full Hd 2"-3-1/2"	638	449
SFN40	NEW Finish Nailer 1-1/4 - 2-1/2	571	389

BOSTITCH AIR NAILERS

N80S-1	Stick Nailer	Super Sale	348
RN45	Coil Roof Nailer 3/4 - 1-3/4	845	409
N60FN-2	Finishing Nailer	650	335
BT35-2	Brad Tacker 5/8" - 1-3/8"	275	165
BT35-2K	BT35-2 w/ case, oil, & brads	299	175
CWC100	1 HP Pancake Compressor	463	289
MIIIFS	Flooring Stapler 15 gauge	931	535
S32SX-2	Finish Stapler - 1/2" - 1-3/8"	275	165
S32SX-2K	S32SX-2 with case & oil	269	179

SKIL SIZZLERS

2735-04	12 volt cordless Drill Kit	249	144
2736-04	2735-04 with keyless chuck	269	148
1605-02	Biscuit Joiner w/case	221	139
3400	10" Table Saw - Bench Top	270	189

SKIL WORM DRIVE SAW SPECIAL

77	Famous 7-1/4" Worm Drive Saw	Sale	144
77M	NEW 77 Mag Worm Saw - 2 lbs lighter than Model 77	Sale	159

Above saws come with FREE 7-1/4" carbide blade ! AND We will ship either saw 2 day Federal Express at NO CHARGE !

PANASONIC CORDLESS

EY6205EQK	Same as EY6205BC but comes with **Ironman** battery	368	192
EY6207BC	NEW 12 volt 1/2" Drill w/keyless chuck var. speed w/15 min. charger & case	420	222
EY6282EQK	Var. spd 9.6 volt Drill with 15 min. charger, case & NEW **Ironman** battery	315	169
EY62821DKW	9.6 volt Drill Kit w/2 batt.	395	162

NEW PREDATOR DRILLS

EY6181CRKW	NEW 9.6V Compact Drill Kit w/2 batt - 10% more pwr than EY62821DKW	305	165
EY6100CRKW	NEW 12 volt Drill Kit with 2 batteries, 1 hour charger, & case	358	188
EY6100CQKW	Same as **EY6100CRKW** but has 15 minute charger	420	198
EY6100EQK	NEW 12 volt Drill kit with NEW **Ironman** battery, 15 min. charger, & cse	375	199
EY6100EQKW	Same as **EY6100EQK** but w/2 **Ironman** batteries	473	225

PASLODE IMPULSE GUNS

IM250	Trimpulse Finish Nailer Kit	849	565
IM325	Impulse Framing Nailer Kit	849	565

WAGNER PAINT & SPRAYER PRODUCTS

230HD	Power Painter/Sprayer	100	95
255	Airless Kit	180	135
375E	Airless System	195	159
505	High performance Airless Painter	440	369
HVLP	Fine coat finishing HVLP System	195	155
CS2000	Pro fine finish HVLP System	339	278

Airy Air Nailers

0241SK
Brad Nailer 3/8"-1 9/16"
Same as Senco SLP-20
List 180 Sale 98

0250SK
Brad Nailer 3/4"-2"
List 296 Sale 164

0626SK
1/4" Crown Stapler 3/8"-1"
List 194 Sale 104

0635SK
1/4" Crown Stapler 1/2"-1-3/8"
Same as Senco SKS
List 310 Sale 175

EZ-1
New Multi-purpose nailer & stapler
List 180 Sale 98

Above Nailers come w/case, fasteners, oil & wrenches

0565T
Angle Finish Nailer 1"-2-1/2"
List 386 Sale 205

DELTA #34-080 10" MITRE BOX XTRA SPECIAL 194.00

TOOLS ON SALE™
AMERICA'S LOWEST PRICED TOOLS
FREE FREIGHT TO THE
48 CONTINENTAL STATES ON EVERY ITEM
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

DEWALT TOOLS

Model	Description	List	Sale
DW364	7-1/4" Circ. Saw w/brake	285	158
DW945K-2	12V cdls Drill Kit w/2 batt	309	179
DW944K-2	9.6V cdls Drill Kit w/2 batt	283	165
DW610	1-1/2 HP 2 handle Router	274	149
DW411	1/4 sheet Palm Sander	97	58
DW100	3/8" Drill, 4 amp,0-2500 rpm	118	68
DW682K	**Biscuit Joiner with case**	429	219
DW705	12" Compound Mitre Saw	706	359
DW625	3 HP var. spd Plunge Router	Sale	275
	DW625 Router comes with FREE DW6966 Fine Depth Adjuster!		
DW930K	NEW 12V 5-3/8" Trim Saw Kit	370	199
DW935K	NEW 14.4V 5-3/8" Trim Saw Kit	444	239
	DW935K comes with FREE DW9054 24 tooth carbide blade!		
DW675K	3-1/8" Planer with case	289	164
DW431	3 x 21 v/spd Belt Sander	331	184
DW444	6" Ran Orb Sander-PSA pad	266	149
DW443	DW444 w/hook & loop pad	266	149
DW673K	NEW Laminate Trimmer Kit	364	215
	NEW DEWALT CORDLESS DRILLS		
DW952K	3/8" v/spd w/two 9.6V batt	280	145
DW953K	3/8" v/spd w/one 12V batt	306	175
DW962K-2	3/8"v/sp w/two 9.6V XR batt	324	179
DW972K-2	3/8"v/sp w/two 12V XR batt	352	189
DW991K	3/8"v/sp w/one 14.4V XR batt	370	199
	Above drill kits come w/ charger & steel case!		

HITACHI TOOLS

C8FB	8-1/2" Slide Compound Saw	1400	575
C10FS	10" Slide Compound Saw	1595	825
P12R	12-9/32" Planer	1470	789
P12RA	Planer/Jointer	1940	989
G12SA	4-1/2" Grinder 6.9 amp	160	89
NR83A	Fram Nailer 2 - 3-1/2 Full Head	700	398
NR83AA	Framing Nailer 2 - 3-1/2	750	419
NT65A	16 ga. Brad Nailer 1 - 2-1/2	610	335
NV45AB	Coil Roofing Nailer 7/8 - 1-3/4	750	419

BIESEMEYER FENCES

B-50	50" Commer. Saw Fence	345	298
T-SQUARE 52	52" Homeshop Fence	279	238
T-SQUARE 40	40" Homeshop Fence	259	208
T-SQUARE 28	28" Homeshop Fence	249	198

JORGENSEN ADJUSTABLE HANDSCREWS

Item#	Jaw Length	Open Cap	List	Sale	Box of 6
#0	8"	4-1/2"	19.76	11.75	58.00
#1	10"	6"	22.63	12.50	68.00
#2	12"	8-1/2"	25.95	14.50	78.00

PONY CLAMP FIXTURES

Model		List	Sale	Lots of 12
50	3/4" Black Pipe Clamps	14.87	7.80	88.95
52	1/2" Black Pipe Clamps	12.40	6.70	71.50

BOSCH

Model	Description	List	Sale
1587VS	NEW Top Hand "CLIC" Jig Saw	292	149
1584VS	NEW Barrel "CLIC" Jig Saw	285	149
Bosch Metal Case for above Jig Saws		34	32
Bosch 30 blade assortment for Jig Saws			28.99
	1584VS or 1587VS with steel case and 30 Bosch blades	Sale	189
1942	Heat Gun 600° - 900°	125	78
1272D	3" x 24" Belt Sander with bag	375	209
1273D	4" x 24" Belt Sander with bag	380	215
11212VSR	Bulldog 3/4"SDS Rtry Drill	390	209
1347AK	4-1/2" Grinder w/cs & access.	185	109
1194VSR	1/2" var. speed Hammer Drill	282	155
1194VSRK	above Hammer Drill w/case.	313	169
1608	5.6 amp Laminate Trimmer	168	99
1609K	Lam Installers Kit with 1609	343	189
1609KX	Deluxe Installers kit	405	234
1604A	1-3/4 HP 2 Handle Router	250	142
1604AK	same as above w/cse & acc	318	185
1606A	1-3/4 HP D-handle Router	295	184
3270DVS	3 x 21v/spd belt sander w/ bag	270	165
1273DVS	var. spd 4" x 24" Belt Sander	415	225
1614EVS	1-1/4HP v/spd Plge Router	283	159
1613EVS	2HP v/sp Plunge Router	359	199
1615EVS	3 HP v/spd Plge Router	505	285
1632VSRK	Recip Saw 8.4A orb-v/spd	225	159
3050VSRK	9.6V cdls v/sp Drill Kit comp	288	149
3051VSRK	3050VSRK w/keyless chuck	299	149
3054VSRK	12V Drill Kit w/ 2 batteries	330	185
3300K	NEW 12V Drill Kit w/ 2 batt	348	199
3310K	NEW 12V T-handle Drill Kit with 2 batteries	348	199
3110K	NEW 9.6V T-handle Drill Kit with 2 batteries	320	185
3283DVS	5" Random Orbit Sander	169	98
3283DVSK	3283DVS Kit complete	199	118
B1650K	NEW Biscuit Joiner	289	155
B7000	NEW Corner Detail Sander	122	68
B7001	B7000 w/ variable speed	156	95
B4050	NEW In Line Jig Saw	199	115
B9250	NEW 5" v/spd Grinder -8.5 amp	263	159
11230EVSN	NEW SDS-max 1-1/2" Rtry Hmr	885	525
11231EVSN	NEW SDS-max 1-3/4" Rotary Hammer	1336	809
11223EVSN	NEW SDS-max 2" Rotary Hmr	1548	929

AEG POWER TOOLS

Model	Description	List	Sale
TXE150	6" var/spd Ran Orb Sander	304	139
HBSE75S	3"x21" var/spd Belt Sander	309	178
BSPE100X	Top Handle Jig Saw w/case	286	159
FSPE100X	Barrel Grip Jig Saw w/case	274	159

PORTA NAILER

401	Porta Nailer complete	265	205
501	Face Nailer complete	265	205

BLACK & DECKER

2694	7-1/4" Super Sawcat w/case	285	158
2695	8-1/4" Super Sawscat w/case	328	175

DAVID WHITE

LP6-20	Sight Level package - 20x	310	205
LP6-20XL	LP6-20 w/9056 tripod & 7620 rod		265
LT8-300	Level Transit - 26x	695	439
LT8-300P	above Level w/optical plum	821	518
LT6-900	Level Transit - 20x	389	254
ALT6-900	Automatic Level - Transit -18x	638	395
ALTP6-900	above Level w/tripod & rod	708	495
ALP6-18HD	above Level w/tripod & rod	570	385
ML100I	NEW Laser Level	1099	945
ML100	NEW Laser Level w/detector	1249	1075

RYOBI SPECIALS

TS-254	10" Mitre Saw	440	209
RE600	3 HP Plunge Router	500	228
BE321	3" x 21" var. spd Belt Sander	310	148
TFD222VRK	12V cordless Drill Kit	365	155
TFF100	Flashlight uses 7.2,9.6,12v battery		9.95
BT3000	10" Table Saw with stand	1125	529
TSS220	8-1/2" Slide Comp. Saw	966	455
AP12	12" Bench Planer	884	395
BS900	9" Bench Band Saw	340	165
OSS450	Oscillating Spindle Sander	340	159
ML618	NEW Mini Lathe var/spd	418	225
DC500	NEW Detail Carver	120	64
TSS200	NEW 8-1/2" Slide Comp. Saw	900	419

SIOUX TOOLS

8030	New 3/8" var/spd Drill	250	145
8000	3/8" var/spd close qtr Drill	201	125
690	5" Air Random Orbit Sander	139	132
Msx636 FEIN	Triangle Sander Kit	Sale	185
LPN672 PONY	Air Palm Nailer w/glove	Sale	94.99

QUAL-CRAFT PRODUCTS

2200	Pump Jack	79	58
2201	Pump Jack Brace	30	20
2203	Pump Jack guard rail holder	31	21
2204	Workbench & rail holder combo	53	39
	Buy any 6 (can be assort.) deduct 10%		
2601	Wall Jack	167	108
	Lots of 4 deduct additional 10%		

PORTER CABLE

690	1-1/2 HP Router 8 amp	260	138
691	1-1/2 HP Router D-handle	285	155
693	1-1/2 HP Plunge Router Base	320	174
6931	Plunge Router Base	125	77
695	1-1/2 HP Router/Shaper	400	223
696	Heavy Duty Shaper Table	230	129
351	3" x 21" Belt Sander w/o bag	280	154
352	3" x 21" Belt Sander with bag	290	159
352VS	3x21 Belt Sander w/bag v/spd	305	169
360	3" x 24" Belt Sander with bag	365	198
361	3" x 24" Belt Sander w/o bag	345	189
362	4" x 24" Belt Sander with bag	380	205
97751	1/2" v/spd Hammer Drill w/cse	270	155
9118	Porta Plane Kit 7 amp	390	215
505	1/2 sheet Pad Sander	230	128
6611	3/8" var. speed Drill 5.2 amp	220	122
6614	1/2" var. speed Drill 0-750 rpm	230	125
6615	7514 with keyless chuck	230	125
7549	Top handle Jig Saw 4.8 amp	270	135
330	Speed Block Sander 1/4 sheet	110	60
556	Biscuit joiner w/5556 tilt fence	Sale	139
345	6" Saw Boss 9 amp	190	104
9345	345 comp. w/cse & carb blde	220	124
9647	TIGER CUB Recip. Saw	210	119
9637	Full var/spd Recip Saw 8 amp	270	148
7519	3-1/4 HP Router 2 Handle	445	239
7518	3-1/4 HP 5 speed Router	510	268
7538	3-1/4 HP Plunge Router	445	239
7399	5.6 amp Drywall Cutout Unit	140	84
7310	5.6 amp Laminate Trimmer	165	95
97310	Laminate Trimmer Kit comp	360	198
7335	5" var. spd Rndm Orbit Sndr	245	132
7336	6" var. spd Rndm Orbit Sndr	250	137
73333	Dust Collection system	31	24.50
7539	3-1/4HP v/spd Plunge Router	510	269
9853	12V 3/8" Drill w/ keyless chuck	280	154
9855	12V 1/2" 2 spd,v/sp Drill w/cs	335	188
8500	12V battery for above drills	Sale	45
332	Palm Grip Rndm Orbit Sander	120	69
333	above Sander with dust bag	135	75
334	333 Sander with PSA pad	135	74
340	1/4 Sheet Orb Sndr w/dust p/u	89	55
7116	24" Omni Jig	535	294
550	Pocket cutter with case	330	179
7700	10" "Lazerloc" Mitre Saw	634	339
310	Production Laminate Trimmer	250	145
347	7-1/4" "Framers" Circ Saw	225	129
347K	347 Saw w/ plastic case	250	134
743	347 Saw - left hand version	225	129
743K	743 Saw w/ plastic case	250	134
9743	743 Saw with case	255	139
9347	347 Saw with case	255	139
447	347 Saw with brake	225	134
843	447 Saw-left hand version	245	139
7800	Drywall Sander	585	329
7810	Wet/Dry Vac for above sander	455	259

FREE FREIGHT TO THE CONTINENTAL STATES ON EVERY ITEM • GIFT CERTIFICATES NOW AVAILABLE

FINISHING TOUCHES

THINKING ABOUT HEATING WITH WOOD?

According to the National Arbor Day Foundation, a woodlot of 3–10 acres could provide you with a lifetime of firewood. Of course, winter's length and temperatures, heater efficiency, insulation, and house size account for the acre variance. But exactly what tree species grow in that woodlot would mean much, too. Hickory, for instance, produces 31 million BTUs per cord. Most softwoods generate only 16 million BTUs a cord.

A WHOLE LOT OF CANADIAN-ASPEN CHOPSTICKS

Disposable chopsticks, or *waribashi* as they are called in Japan, come to the island nation from the forests of China, Indonesia, the Philippines, South Africa, and Canada. In British Columbia alone, about 88,000 cords of the finest-grade aspen—enough for 8 million pairs—are cut every day, reports the magazine *Mother Jones*. Such production has enabled the Canadian Chopstick Manufacturing Company (partially owned by Mitsubishi) to capture a third of the market.

Illustrations: Jim Stevenson
Photographs: Chuck Bowman

Carving goes radio-control

You never can tell what a carver will come up with next, especially when a carver also happens to be a magician and a modelmaker. Here's what came our way from Chuck Bowman of Kentwood, Michigan. His "Battery-O-Saurus," shown under construction *below right* and finished *right*, stands 4' tall, required 220 pounds of basswood, and 800 hours of power carving and sanding. Chuck then spent 200 hours fitting his creation with radio-controlled, battery-operated electronic circuits that drive the moving eyes, head, wheels, cassette player, audio amplifier, and a pump to squirt water when he cries!

Chuck likes to refer to his woodcarving as "wood butchering," and believes that a true wood butcher starts with a pile of wood, glue, clamps, and enough tools to make sawdust. "But," he emphasizes, "no plans. They only stifle creativity. Use the brown paper bag that the glue came in to make a crude drawing, then tape it to the wall. If the final result doesn't look anything like the drawing, make a new drawing!" Chuck, after handcrafting this piece of work, that's easy for you to say!

Michigan woodcarver, modelmaker, and professional magician Chuck Bowman used 220 pounds of basswood and took 800 hours to carve his robot. Fitted with remote-control circuitry, Chuck's completed "Battery-O-Saurus" rolls, moves it head and eyes, cries, and talks.

Environmentally correct plywood now on the market

Five years ago woodworkers and woodworking suppliers, forestry representatives, researchers, and others formed the Woodworkers Alliance for Rainforest Protection (WARP). Then came private certification programs that give the stamp of approval (a lengthy and expensive process) to timber producers who exhibit responsible, sustained-yield forestry practices. This list of "Good Wood" suppliers now numbers over two dozen and keeps growing. Continually added to the list also are product manufacturers, retail outlets such as home centers, and now even a producer of environmentally sound hardwood plywood.

Buchner Panel Manufacturing, of San Francisco, fabricates hardwood plywood using maple, cherry, and red oak veneers that come from certified sustainable sources. Even the substrates of these panels, marketed under the EcoPanel name, consist of environmentally friendly materials.

One such material is Gridcore, a non-toxic honeycomb material made from recycled paper. The other core option, Medite II, is medium-density fiberboard manufactured without formaldehyde. The panels are at this writing undergoing study for certification by California-based Scientific Certification Systems. Buchner currently sells its product—competitively priced with other custom architectural sheet goods—to millwork and fixture producers .

For more on EcoPanels, call Buchner at 800-4-VENEER, or EcoTimber International, 415/864-4900. For a Good Wood list, write WARP, One Cottage St., Easthampton, MA 01027.

Why Two Tanks?

Introducing the mighty 2-tank Wet/Dry Vac.™

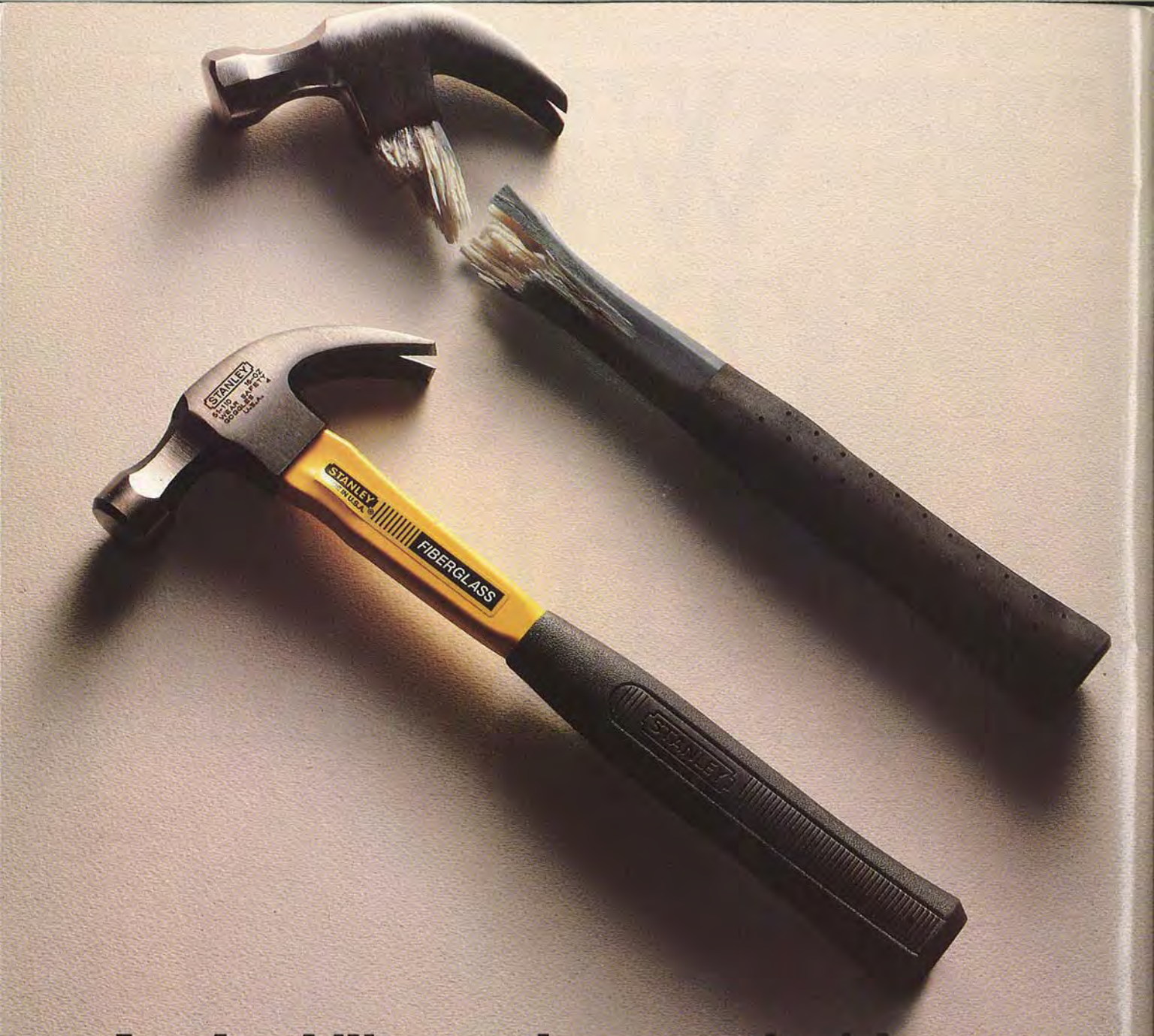
We've revolutionized the way you pick up dirt. The Hoover® wet/dry utility vac has an exclusive 2-tank system that provides instant change-overs from dry...to wet...and back, without emptying tanks or changing filters during the job. So what's wet stays wet, and what's dry stays dry.

Take out the inner tank and convert it to a one tank vac for wet, dry or both!

Detachable blower, 12 piece attachments include both 1¼" and 2½" sizes, tank drain and more.

For details call 1-800-293-4605. You'll thank Hoover for giving you 2-tanks.

NOBODY GETS THE DIRT LIKE HOOVER. NOBODY.™



In a durability test, the competitor's hammer lasted 60 seconds. If you happen to need one for longer than that, buy a Stanley hammer.

This picture tells the story better than any words can. In our overstrike tests, the Stanley hammer outlasted the competitor's brand by a 4 to 1 ratio.*

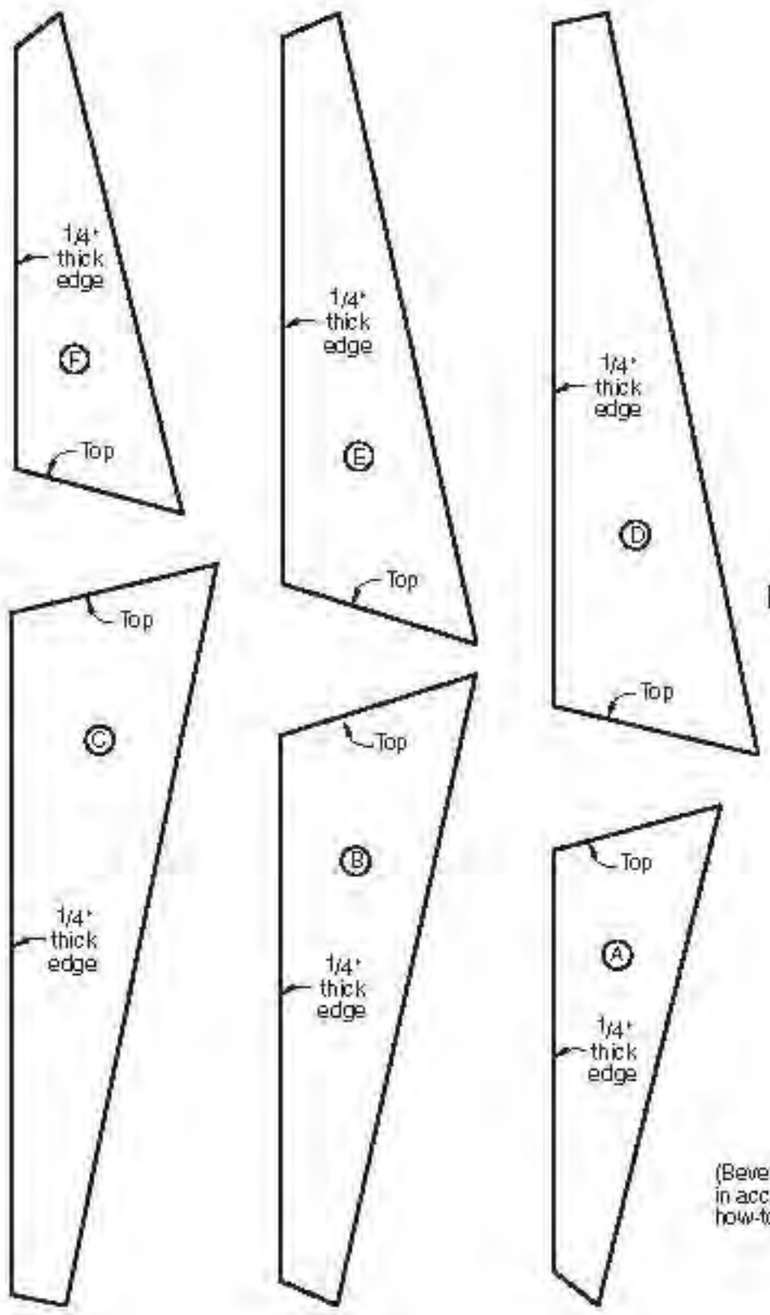
You see, after years of research (and a whole lot of sleepless nights) our engineering department concluded that jacketed, solid-core fiberglass is more durable than the compression-molded variety some of our competitors use to make their hammers.

That's the Stanley philosophy. Don't quit working until your product is perfect. You'll find this kind of dogged determination across the board at Stanley. In everything we make. Like a garage door insulated to reduce noise. Or a closet organizer made with steel planks instead of wire so it doesn't wrinkle your clothes.

It's innovative thinking like this that's kept us ahead of the competition for more than 150 years. At Stanley we're not happy simply churning out products. We're only happy when our products are better than anyone else's.

STANLEY
helps you do things right.®

*Overstrike test conducted by striking hammer handle against metal object. © 1994 The Stanley Works



NAPKIN HOLDER
Page 74

(Bevel top edges 15° in accordance with how-to instructions)

Better Homes and Gardens®

WOOD® PATTERNS™

Full-sized for your woodworking convenience

AUGUST 1995 **ISSUE 80**

Dear Reader: As a service to you, we've included full-sized patterns on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Bill of Materials and the drawings accompanying the project you're building.

- **Doghouse**
- **Computer desk**
- **Napkin holder**

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Page 62

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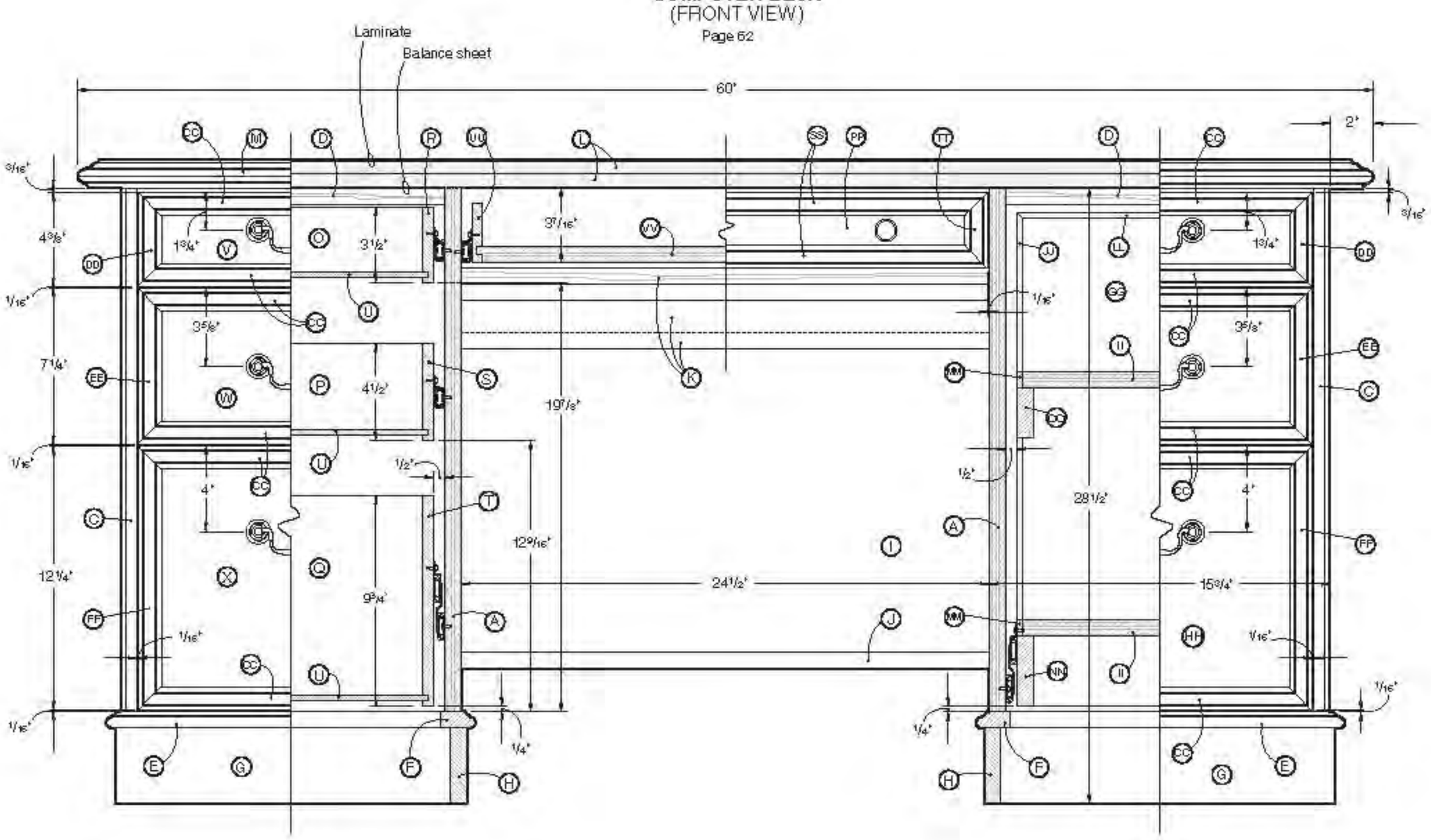
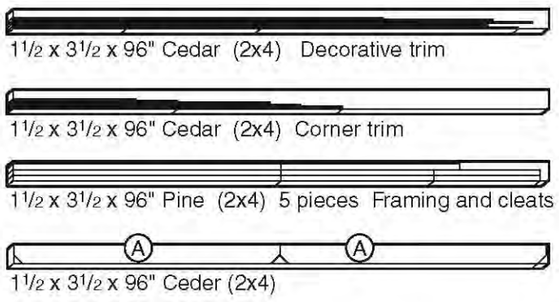
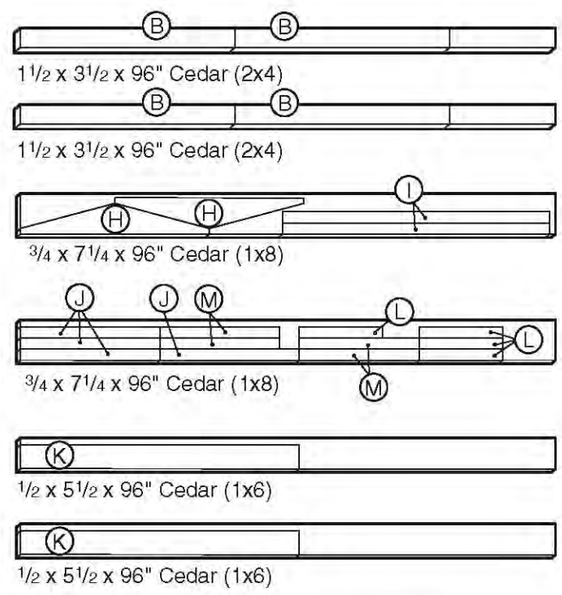
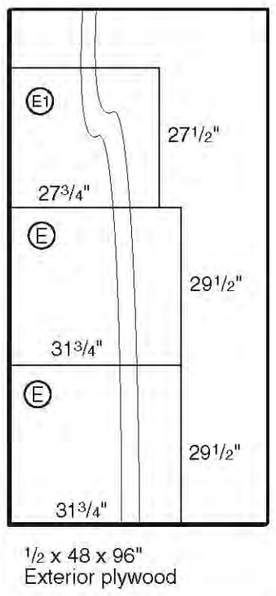
COMPUTER DESK
(FRONT VIEW)
Page 62



DOGHOUSE
Cutting Diagram

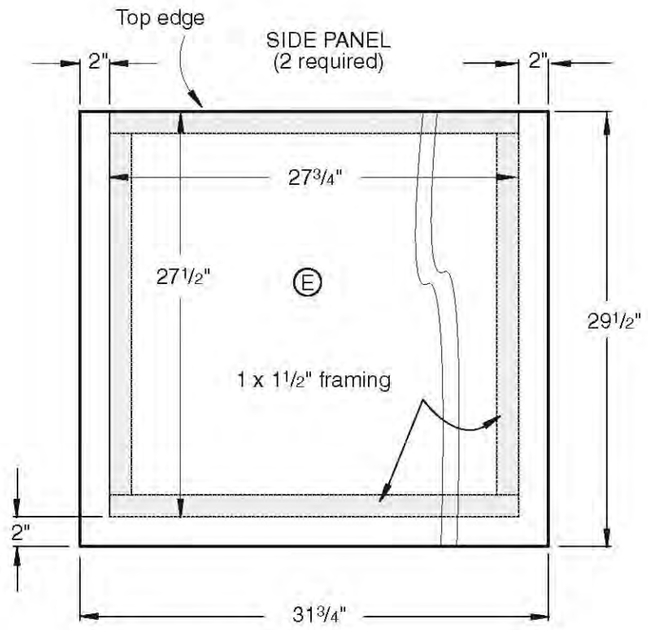

1½ x 3½ x 96" Cedar (2x4) Decorative trim
1½ x 3½ x 96" Cedar (2x4) Corner trim
1½ x 3½ x 96" Pine (2x4) 5 pieces Framing and cleats
A
A
1½ x 3½ x 96" Ceder (2x4)

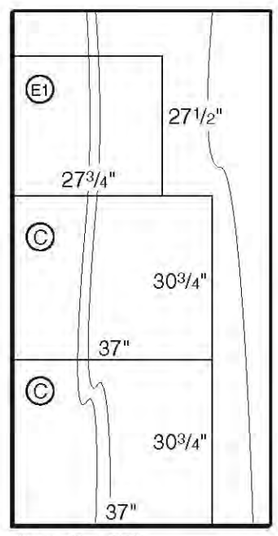




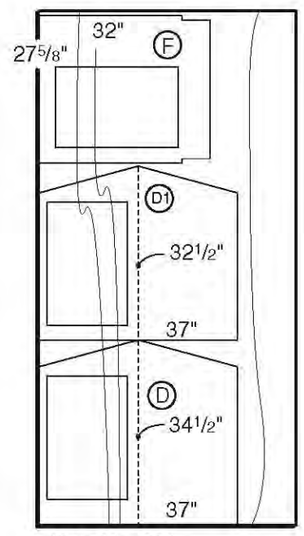
½ x 48 x 96"
Exterior plywood

DOGHOUSE
PARTS
VIEW

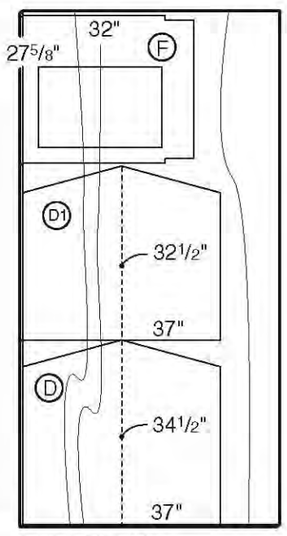




½ x 48 x 96"
Exterior plywood

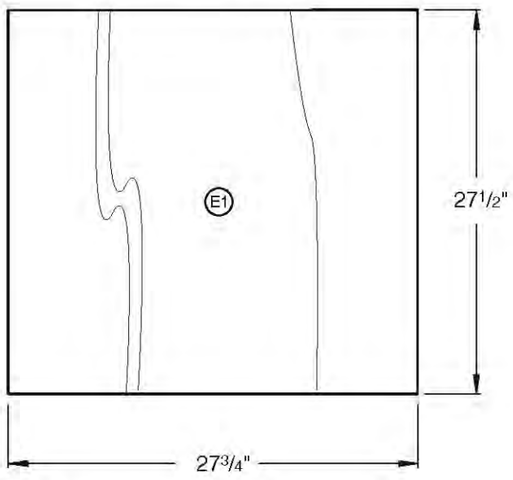


½ x 48 x 96"
Exterior plywood

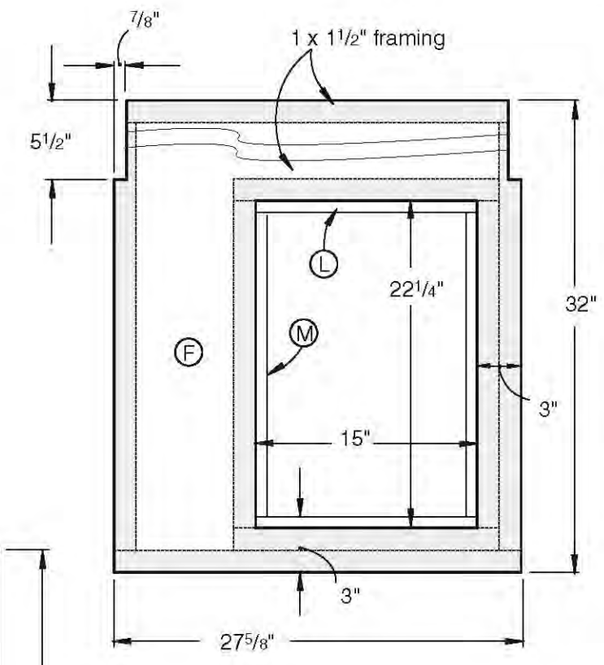


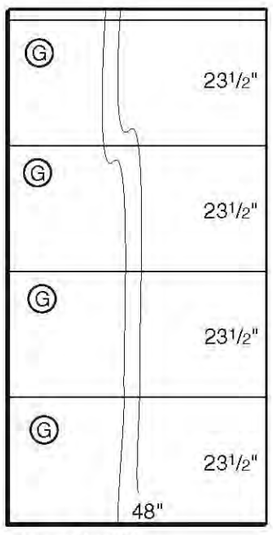
½ x 48 x 96"
Exterior plywood

INSIDE PLY FOR SIDE PANEL

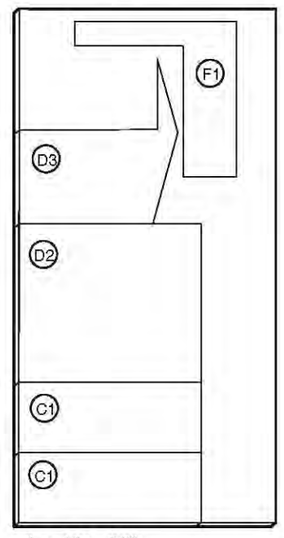


PARTITION

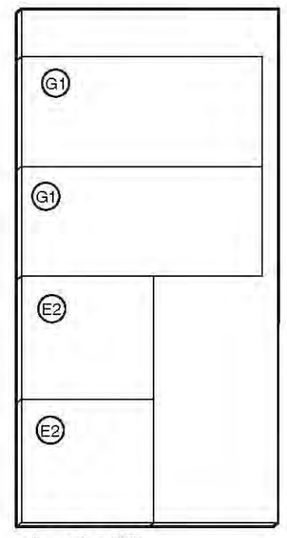




½ x 48 x 96"
Exterior plywood

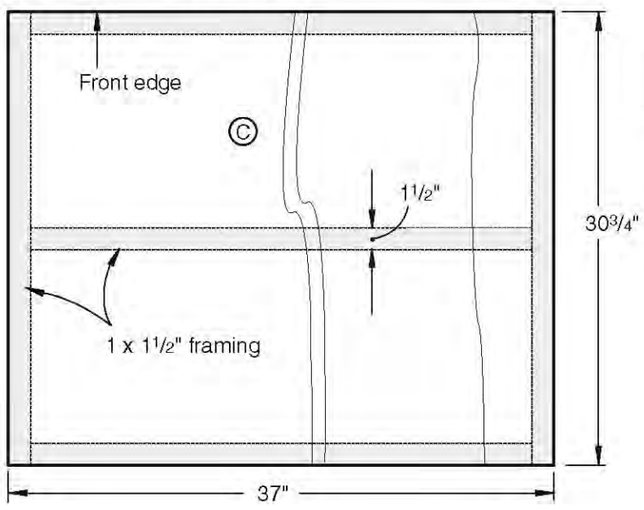


1 x 48 x 96"
Rigid foamboard

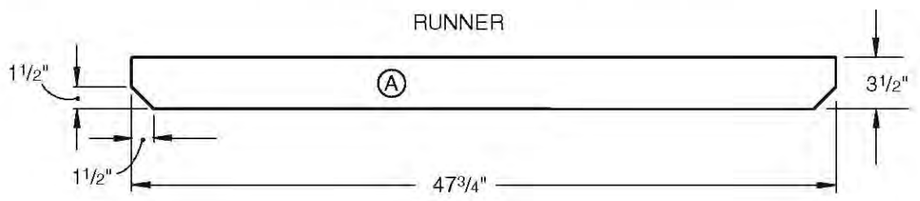


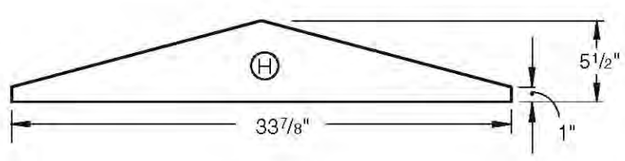
1 x 48 x 96"
Rigid foamboard

FLOOR PANEL



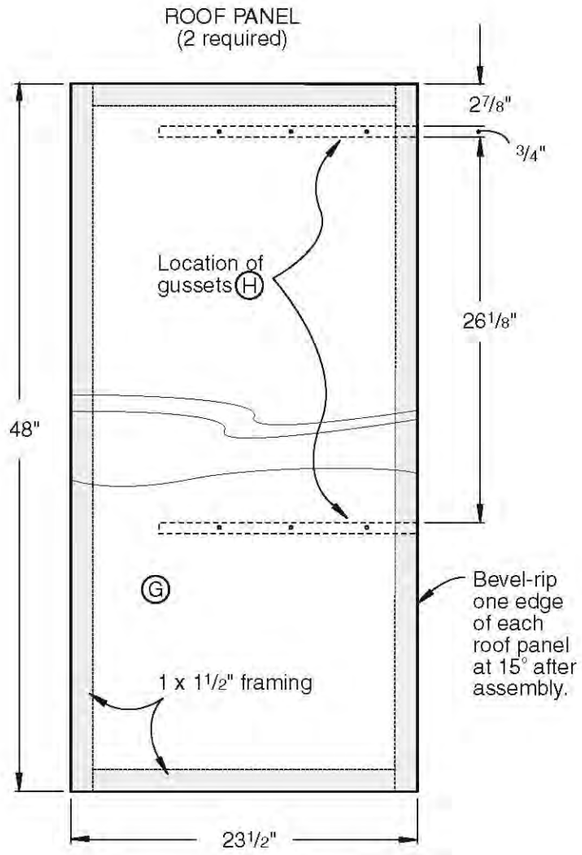
RUNNER



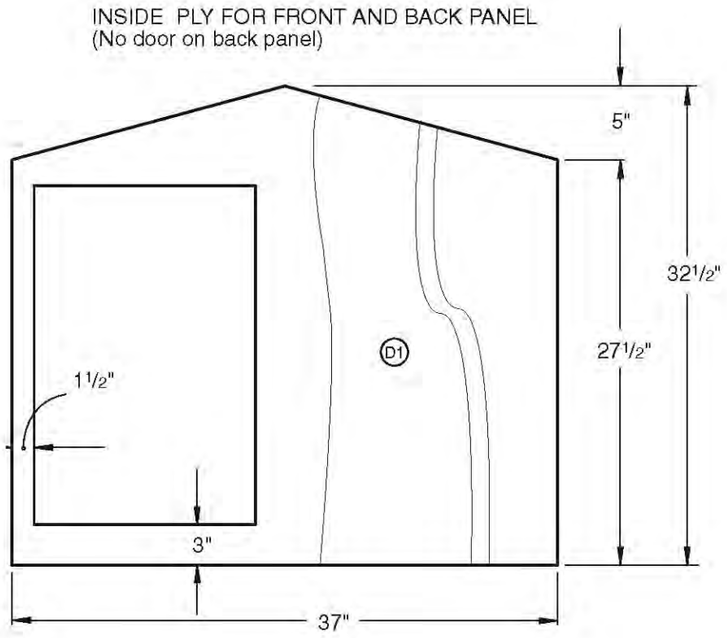
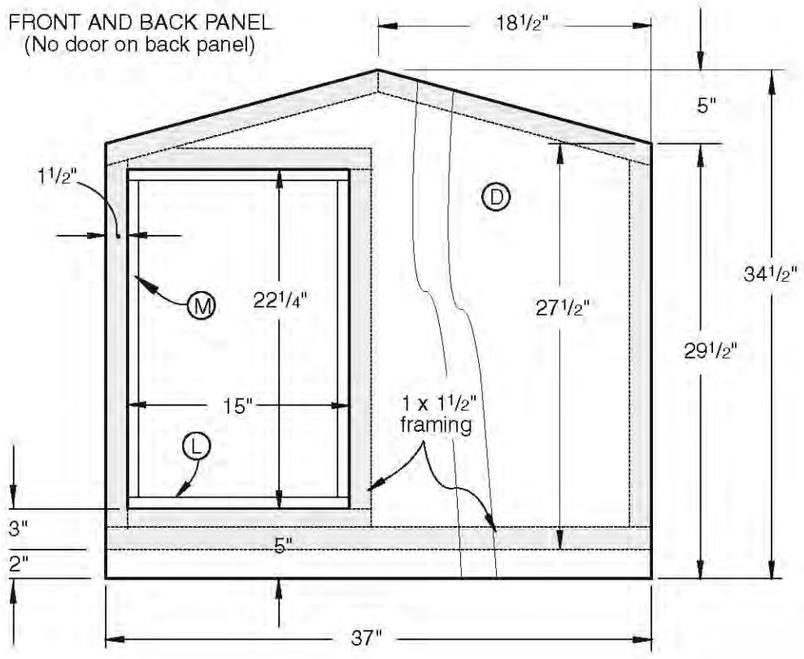


GUSSET

ROOF PANEL
(2 required)



INSIDE PLY FOR FRONT AND BACK PANEL
(No door on back panel)



FRONT AND BACK PANEL
(No door on back panel)